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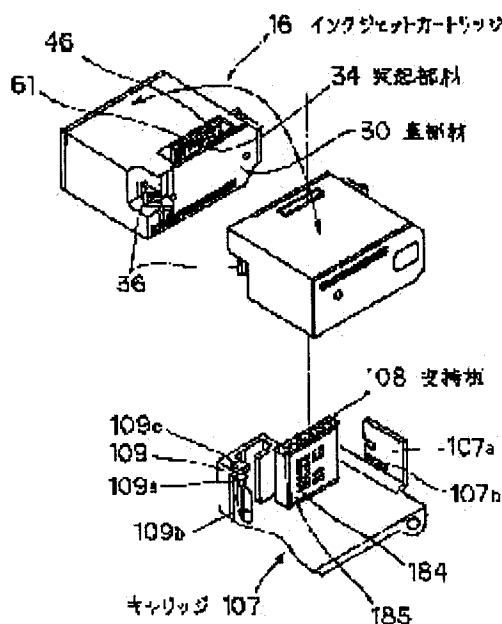
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(54) **INK JET CARTRIDGE**

(57)Abstract:

PROBLEM TO BE SOLVED: To eliminate damage of an ink jet recorder even when an ink cartridge is unreasonably mounted without correct combination in an ink jet recorder.
SOLUTION: A cover member 30 is fixed to the ink jet cartridge 16. A protrusion member 34 is provided as an erroneous mounting preventing means for preventing erroneous mounting in an ink jet recorder of an erroneous combination on a rear surface of the member 30. A breaking strength of the member 34 is set smaller than that of a support plate 108 interfered with the member 34 when the cartridge 16 is intended to be mounted in a carriage 107 provided in the recorder.



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CLAIMS

[Claim(s)]

[Claim 1] The ink jet recording head section which breathes out ink and records on recorded media, It is the ink jet cartridge by which the ink tank which holds the ink supplied to said ink jet recording head section is united, is constituted, and an ink jet recording apparatus is equipped with it. Even if it equips, when it is going to equip the ink jet recording device which cannot be used An incorrect wearing prevention means to prevent incorrect wearing to said ink jet recording apparatus by interfering with said some of ink jet recording apparatus is established. The disruptive strength of said incorrect wearing prevention means The ink jet cartridge characterized by being set up smaller than the disruptive strength of the member of the ink jet recording apparatus in which said incorrect wearing prevention means interferes.

[Claim 2] Said incorrect wearing prevention means is an ink jet cartridge according to claim 1 which is a projection member.

[Claim 3] Said incorrect wearing prevention means is an ink jet cartridge according to claim 1 to which the disruptive strength of the fixed part of said outer wall member and said ink tank is set smaller than the disruptive strength of the member in which said incorrect wearing prevention means interferes including the outer wall member fixed to said ink tank possible [desorption].

[Claim 4] Said outer wall member is an ink jet cartridge according to claim 3 currently fixed to said ink tank by the thermal melting start stage.

[Claim 5] Said outer wall member is an ink jet cartridge according to claim 3 currently fixed to said ink tank by the adhesion means.

[Claim 6] Said outer wall member is an ink jet cartridge according to claim 3 currently fixed to said ink tank by the attachment means.

[Claim 7] Said incorrect wearing prevention means is the ink jet cartridge of six given in any 1 term from claim 1 currently arranged in the location which does not spoil the function which said ink jet cartridge has even if destroyed.

[Claim 8] Said ink jet recording head is the ink jet cartridge of seven given in any 1 term from claim 1 which has the electric thermal-conversion object which generates the heat energy used in order to make ink breathe out.

[Claim 9] Ink is an ink jet cartridge according to claim 8 breathed out using film boiling produced with the heat energy impressed with said electric thermal-conversion object.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the ink jet cartridge with which the ink jet recording apparatus which breathes out ink and records an image on recorded media is equipped.

[0002]

[Description of the Prior Art] With the recording device used as output units, such as a computer, and a word processor, a workstation, or the recording device used as an output means of a copying machine or facsimile, it is an image (an alphabetic character and a notation are included.). It is below the same. Based on the image information inputted into the recording device, it is recorded on recorded media including plastics sheet metal, such as a record form or an OHP sheet.

[0003] The so-called ink jet recording apparatus is in one of such the recording apparatus. An ink jet recording apparatus is a recording apparatus which breathes out ink to recorded media from the nozzle prepared in the ink jet recording head, and records an image on recorded media. Since it is that a highly precise image is recordable at high speed, that it is recordable on the regular paper by which special processing is not made, and a non impact type as an advantage of an ink jet recording device, it is known that the noise at the time of record is small, that it is easy to record a color picture using further multicolor ink, that the miniaturization of an ink jet recording head is easy, etc.

[0004] by the way, the thing of a configuration of that the ink tank was connected to the ink supply means to the ink jet recording head in an ink jet recording apparatus through the tube etc. at the ink jet recording head -- or there is a thing of various gestalten, such as a thing using the ink jet cartridge with which the ink jet recording head and the ink tank were united. Among those, for example it is carried in U.S. Pat. No. 4771295 (JP,63-84239,A) removable to a recording apparatus, and it is an exchangeable ink jet cartridge, and fills up with an ink absorber in an ink tank about an ink jet cartridge, and what is infiltrating ink into the ink absorber is indicated. In addition, such an ink jet cartridge is already marketed widely.

[0005] On the other hand, recently, the nozzle of an ink jet recording head is arranged more by high density, and record of a high definition image is attained. For example, the color picture record not only using alphabetic character record but the color ink only using black ink and record of a still high definition photograph tone image are also attained. The thing not only using what the class of ink used with a recording device was also becoming various in connection with this, for example, melted the color to the drainage system solvent about black ink but a pigment, the thing which has a water resisting property even if it is a color are used. About color ink, moreover, by making light concentration of each color of not only the ink of mere yellow, MAZENDA, and cyanogen but ink Gradation nature is given to the lightness between the monochrome part in a record image, and the part which two or more colors piled up, and red, Green, and blue ink are also used for the ink of the yellow which can acquire more nearly high-definition record image quality, MAZENDA, and cyanogen, and a pan. The class of ink jet cartridge is increasing according to such a background, and the class of ink jet

recording device is also increasing that it should correspond to each ink jet cartridge.

[0006] By the way, since many components are communalized in order that an ink jet cartridge and an ink jet recording device may aim at reduction of a production cost, and compaction of a development cycle, the configuration is similar for various kinds. Then, an ink jet recording apparatus and it can be equipped, and user support is performed by explanation at a shop front, and a catalog and an operation manual about combination with an ink jet cartridge recordable good. However, there is not no possibility that a user will equip with the ink jet cartridge which does not support an ink jet recording apparatus accidentally. When equipped with the ink jet cartridge which does not support an ink jet recording apparatus, since drive conditions differ, in the printer driver with which the ink jet recording apparatus is equipped, the case where record is not carried out at all by the difference in the discharge quantity of an ink class or ink, the difference in a nozzle consistency, etc., or a normal image is not recorded may be generated.

[0007] Then, in order to prevent such a situation, at least one side of an ink jet recording apparatus and an ink jet cartridge is equipped with the discernment means for identifying whether it is incorrect wearing. While preparing heights in an electric discernment means identify incorrect wearing by reading with a signal reading means to by_which the recognition signal given to the ink-jet cartridge is established as a discernment means at the ink-jet recording device side, and an ink-jet cartridge, in an ink-jet recording device, the crevice into which the heights of an ink-jet cartridge fit establishes, and there is a structural discernment means identify incorrect wearing in it, in the mistaken combination by being unable to equip an ink-jet recording device with an ink-jet cartridge, and carrying out it.

[0008] Among the above-mentioned discernment means, with an electric discernment means, after being equipped with an ink jet cartridge, it is identified whether it was incorrect wearing. However, the delivery side of the nozzle of an ink jet cartridge is protected to an ink jet recording apparatus, or the capping means for attracting ink is formed in it from the nozzle, and the ink of an ink jet cartridge with which the ink jet recording apparatus was equipped before remains in this capping means somewhat. Therefore, if a KYAPINGU means contacts the nozzle of the ink jet cartridge with which it was newly equipped, heterogeneous ink will be mixed on the front face of a nozzle and a capping means. thus, the cause of fixing of ink being promoted if heterogeneous ink is mixed -- especially, with the nozzle of an ink jet recording head, since ink is not normally breathed out until the ink which fixed after starting record is removed, the recorded image may become blurred When fixing of ink progresses further, the nozzle of an ink jet recording head is got blocked, or it is considered that a capping means also stops functioning normally.

[0009] On the other hand, among the above-mentioned discernment means, with the structural discernment means, only when the heights prepared in the ink jet cartridge and the crevice established in the ink jet recording apparatus are the cases where an ink jet cartridge and a recording apparatus are right combination, it is prepared so that it can fit in and equip. Thereby, since incorrect wearing of an ink jet cartridge can be prevented beforehand, heterogeneous ink is not mixed as mentioned above.

[0010] So, the above-mentioned structural discernment means is widely used for the discernment means of incorrect wearing of an ink jet cartridge.

[0011]

[Problem(s) to be Solved by the Invention] However, in the case where the above-mentioned structural discernment means is used, in spite of being the combination which the ink jet recording apparatus and the ink jet cartridge mistook, when unreasonableness has been equipped with the ink jet cartridge, with a user not noticed, at least one side will be damaged among an ink jet recording apparatus and an ink jet cartridge. When an ink jet cartridge side is damaged, if the ink jet cartridge of another normal is prepared, it can record immediately. However, when an ink jet recording apparatus side is damaged, it will be necessary to fix an ink jet recording apparatus, the burden which a user receives since it becomes impossible to use an ink jet recording apparatus is large during a repair period, and the breakage by the side of an ink jet recording apparatus is not desirable.

[0012] Then, this invention aims at offering the ink jet cartridge which has the incorrect wearing prevention means which does not damage an ink jet recording apparatus even if it is the case where an ink jet recording apparatus is equipped with the ink jet cartridge which is not right combination by force.

[0013]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the ink jet cartridge of this invention The ink jet recording head section which breathes out ink and records on recorded media, It is the ink jet cartridge by which the ink tank which holds the ink supplied to said ink jet recording head section is united, is constituted, and an ink jet recording apparatus is equipped with it. Even if it equips, when it is going to equip the ink jet recording device which cannot be used An incorrect wearing prevention means to prevent incorrect wearing to said ink jet recording apparatus by interfering with said some of ink jet recording apparatus is established. The disruptive strength of said incorrect wearing prevention means It is set up smaller than the disruptive strength of the member of the ink jet recording device in which said incorrect wearing prevention means interferes.

[0014] Even if it should equip, when the ink jet recording apparatus which cannot be used is equipped with an ink jet cartridge by force by this, before the part in which an incorrect wearing prevention means interferes among the members in an ink jet recording apparatus is damaged, the incorrect wearing prevention means of an ink jet cartridge is damaged.

[0015] Moreover, when said incorrect wearing prevention means is a projection member, it is recognized by the user by a feel and an acoustic sense in case a projection member is damaged that it is incorrect wearing.

[0016] Furthermore, said incorrect wearing prevention means contains the outer wall member fixed to said ink tank possible [desorption]. By setting up smaller than the disruptive strength of the member in which said incorrect wearing prevention means interferes the disruptive strength of the fixed part of said outer wall member and said ink tank Even if it should equip, when the ink jet recording apparatus which cannot be used is equipped with an ink jet cartridge by force, an outer wall member is desorbed from an ink tank. Therefore, compared with the case where only a projection damages and ****s, it is clearly recognized by the user that it is incorrect wearing.

[0017] In addition, as for said outer wall member, it is desirable to be fixed to said ink tank by the thermal melting start stage, the adhesion means, or the attachment means.

[0018] Moreover, even if said incorrect wearing prevention means is the ink jet cartridge by which the incorrect wearing prevention means was destroyed by incorrect wearing by

being arranged in the location which does not spoil the function which said ink jet cartridge has even if destroyed, the function which an ink jet cartridge has is not spoiled.
[0019]

[Embodiment of the Invention] Next, the operation gestalt of this invention is explained with reference to a drawing.

[0020] The outline of 1 operation gestalt of an ink jet recording device in which first use drawing 1 and the ink jet cartridge of this invention is used is explained. Drawing 1 is the perspective view showing the outline configuration of 1 operation gestalt of the ink jet recording device with which the ink jet cartridge of this invention is used.

[0021] As shown in drawing 1, the leading screw 2 by which spiral slot 2a was minced is supported by the ink jet recording device 1 free [rotation]. Through the driving force transfer gear 6 prepared in the leading screw 2, and the driving force transfer gear 5 which is bit and put together and is prepared in the driving force transfer gear 6, a leading screw 2 is interlocked with the forward inverse rotation of a drive motor 4, and is rotated. Moreover, the pin (un-illustrating) prepared in the part which supports a leading screw 2 engages with spiral slot 2a, and the carriage 7 with which the ink jet cartridge 16 is carried is formed free [sliding] to the leading screw 2 and the guide rail 3. Since the forward inverse rotation of a drive motor 4 is interlocked with and a pin is guided to spiral slot 2a by this, carriage 7 moves in accordance with the shaft orientations (X shaft orientations of illustration) of a platen roller 11. Paper feed of the recorded media 10, such as a record form and plastics sheet metal, is carried out by the platen roller 11. In addition, in the range which meets the ink jet recording head (un-illustrating) of the ink jet cartridge 16 among the front faces of recorded media 10, it is formed more broadly than a platen roller 11, and recorded media 10 are pressed by the peripheral surface of a platen roller 11 with the paper bail plate 12 formed along the migration direction of carriage 7.

[0022] Moreover, the ink jet recording apparatus 1 is equipped with photo couplers 13 and 14 as a home-position detection means for detecting passage of the lever 15 prepared in carriage 7, and performing the change of the hand of cut of a drive motor 4 etc. Furthermore, in the location (for example, home position) from which the ink jet recording head of the ink jet cartridge 16 separated from the record section, the capping means 20 of a wrap (capping) sake is arranged in the location which meets an ink jet recording head in the ink delivery side of an ink jet recording head. The KYAPINGU means 20 is supported by the supporter material 21, it has a suction means 22 to attract ink from the ink delivery of an ink jet recording head further, and suction recovery of an ink jet recording head is performed by attracting the ink delivery of an ink jet recording head through the opening 23 in a cap.

[0023] The cleaning blade 26 which the support plate material 25 is attached and was supported by the support plate material 25 possible [sliding] is formed in Y shaft orientations of illustration movable by the driving means (un-illustrating), and cleaning of an ink jet recording head is performed in the frame part material 24 of the ink jet recording device 1 by contacting and estranging to an ink jet recording head.

[0024] The cam 28 is formed in the location which contacts when it moves to a location with carriage 7. The lever 27 is formed so that it may interlock and may carry out movable to the cam 28 moved to carriage 7. In connection with a motion of a lever 27, transfer of the driving force from a drive motor 4 is controlled by controlling the power

means of communication of common knowledge, such as a gear 29 and a clutch (un-illustrating).

[0025] When carriage 7 moves to a home-position field, alignment of each processing stroke of the above-mentioned capping, suction recovery, and cleaning is carried out to the location where an ink jet recording head meets the opening 23 in a cap, or a cleaning blade 26, and it is performed. These each processing stroke and alignment strokes of an ink jet recording head can be performed in the mode of arbitration using well-known timing and a well-known sequence. Moreover, each of these processing strokes may be performed independently and may be performed complexly.

[0026] In addition, the ink jet recording apparatus 1 may be equipped with an electric discernment means to identify incorrect wearing, by reading with a signal reading means by which the recognition signal given to the ink jet cartridge 16 is established at the ink jet recording apparatus 1 side.

[0027] Next, the configuration of 1 operation gestalt of the ink jet cartridge of this invention is explained. The perspective view in which drawing 2 shows the whole 1 operation gestalt configuration of the ink jet cartridge of this invention, the fluoroscopy perspective view of the ink jet recording head in the ink jet cartridge which showed drawing 3 to drawing 2, and drawing 4 R> 4 are the decomposition perspective views of the ink jet cartridge shown in drawing 2.

[0028] As shown in drawing 2 and drawing 4, the ink jet cartridge 16 has the structure where the ink jet unit 18 equipped with the ink jet recording head 17 and the ink tank 19 which holds ink were attached to one.

[0029] The perspective view shown where drawing 5 is seen from [which showed the ink jet cartridge shown in drawing 2 to drawing 2] A, and drawing 6 are the perspective views showing the rear face of covering device material shown in drawing 5.

[0030] As shown in drawing 5, the covering device material 30 forms the enclosure 31 which surrounds and contains the ink jet unit 18 between the ink tanks 19 while being some outer walls of the ink jet cartridge 16. Moreover, the claw part 36 which engages with hook 9a (refer to drawing 8) of the carriage 7 mentioned later is formed in the ink jet cartridge 16. The covering device material 30 is being fixed to the ink tank 19 in the two welding sections 32 and 33. In addition, as shown in drawing 5 and drawing 6, the projection member 34 as an incorrect wearing prevention means to prevent incorrect wearing to the mistaken ink jet recording device of combination is formed in the rear face of the covering device material 30. Moreover, as shown in drawing 6, the pin hole 35 is formed in the welding sections 32 and 33 at the covering device material 30. Two welding pins (un-illustrating) prepared in the ink tank 19 are inserted in two pin holes 35 of the covering device material 30, respectively, and caulking immobilization of the covering device material 30 is carried out to the ink tank 19 by crushing the head of a welding pin by heat. With this operation gestalt, the covering device material 30 is formed with Noryl resin, and the magnitude of the projection member 34 is formed in about 0.5mm in height of about 3mm, 4mm of ****, and thickness. In addition, the molding material of the covering device material 30, the configuration of the projection member 34, and a dimension are not limited above.

[0031] Then, the configuration of the ink jet recording head 17 is explained.

[0032] As shown in drawing 3, two or more deliveries 37 are established in seriate, and the liquid ink way 39 for supplying ink is arranged in each delivery 37 by the ink jet

recording head 17. The electric thermal-conversion object 38 which generates heat energy with the supplied applied voltage as an energy component for making ink breathe out from a delivery 37 is arranged in each liquid ink way 39. By impressing a driving signal to each electric thermal-conversion object 38 alternatively according to a picture signal, ink is made to produce film boiling with the heat energy generated from the electric thermal-conversion object 38, and air bubbles are generated in the liquid ink way 39. By growing up these air bubbles further, an ink droplet is breathed out from a delivery 37.

[0033] In addition, each electric thermal-conversion object 38 is established on the heater board 40 which consists of a silicon substrate, and is formed in one by the membrane formation technique by semi-conductor manufacture processes, such as etching, vacuum evaporation, and sputtering, with wiring and the electrode (un-illustrating) of the aluminum which supplies power to each electric thermal-conversion object 38. A delivery 37 can manufacture easily by this the ink jet recording head 17 arranged by high density, and much more miniaturization of the ink jet recording head 17 can be attained. Moreover, by utilizing the advantage of IC technique or a micro processing technique, long-picture-izing of the ink jet recording head 17 and shape[of a field]-izing (two-dimensional-izing) are also easy, and the formation of full multi and high-density-assembly-izing of the ink jet recording head 17 are also still easier.

[0034] Moreover, the top plate 42 with which the common liquid room 41 which contains temporarily the septum for classifying each liquid ink way 39 and the ink supplied to each liquid ink way 39, the ink receiving window 43 (refer to drawing 4) for introducing ink into the common liquid room 41 from the ink tank 19, etc. were formed is really fabricated. As a molding material of a top plate 42, although polysulfone is desirable, other molding resin ingredients, such as polyether sulfone, polyphenylene oxide, and polypropylene, may be used.

[0035] Next, the configuration of the ink jet unit 18 is explained.

[0036] As shown in drawing 4 , the metal base material 45 has the holes 50, 51, and 52 which engage with two projections 47a and 47b for positioning prepared in the ink tank 19, and two projections 48 and 49 (projection 49 is referring to drawing 7) for thermal melting arrival maintenance, and also has the projections 53 and 54 for positioning to carriage 7. In addition, a base material 45 is made to penetrate the ink supply pipe 55 mentioned later, and the hole 56 for forming the ink passage from the ink tank 19 is formed. In addition, near the projections 53 and 54 for positioning of a base material 45 crevices 57 and 58 are formed, respectively. Crevices 57 and 58 In the assembled ink jet cartridge 16 (refer to drawing 2) By being located on the production of the parallel slots 59 and 60 of each plurality formed in three sides around the ink jet unit 18 in the ink jet cartridge 16, it is constituted so that discard, such as dust and ink, may not result in projections 53 and 54.

[0037] The wiring substrate 46 is stuck on the base material 45 by the binder etc. Two or more pads 61 for receiving the electrical signal from the ink jet recording device 1 are formed in the end of the wiring substrate 46, and the wiring part of the heater board 40 which is also the substrate of the ink jet recording head 17 is connected to the other end. Each pad 61 supports each electric thermal-conversion object 38 (refer to drawing 3) prepared in the ink jet recording head 17, and the electrical signal from the ink jet recording device 1 passes along each pad 61, and is supplied to each electric thermal-

conversion object 38 according to an individual.

[0038] The pressure spring 62 for fixing the ink jet recording head 17 to a base material 45 is formed in the M character configuration. The heater board 40 and the top plate 42 are arranged between the pressure spring 62 and the base material 45, and the heater board 40 and a top plate 42 are fixed in the condition of having been put between the pressure spring 62 and the base material 45, by making the foot of a pressure spring 62 engage with the rear-face side of a base material 45 through the hole 63 of a base material 45. while the part of the outer wall of the common liquid room 41 (refer to drawing 3) is pressed by the center section of the shape of an M typeface of a pressure spring 62 by light pressure among the outer walls of a top plate 42 at this time -- a pressure spring 62 - front -- the who section 64 -- a part of liquid ink way 39 (refer to drawing 3) of the ink jet recording head 17 -- the intensive press of the about 37-delivery field is preferably carried out with the linear pressure.

[0039] the ink which the ink supply pipe 55 is formed in the ink feed zone material 65 for supplying the ink supplied from the ink tank 19 to the ink jet recording head 17 in the shape of a cantilever, and was connected with the ink supply pipe 55 -- a conduit 66 has - having -- further -- ink -- the closure pin 67 for securing the capillarity between a conduit 66 and the ink supply pipe 55 is inserted. In addition, the closure of the bond part of the ink tank 19 and the ink supply pipe 55 is carried out by press fit.

[0040] Since the ink feed zone material 65 is really fabricated by mold shaping, its dimensional accuracy of each part is high. for example, ink -- since the dimensional accuracy of each part of the ink feed zone material 65 is high, the pressure-welding condition over the ink receiving window 43 of a conduit 66 is stable. here -- ink -- if the adhesives for closure resin are slushed from the ink feed zone material 65 side where the pressure welding of the conduit 66 is carried out to the ink receiving window 43 -- ink -- the more positive free passage condition of a conduit 66 and the ink receiving window 43 can be acquired. Moreover, immobilization of the ink feed zone material 65 to a base material 45 is simply performed by making the holes 68 and 69 of a base material 45 penetrate two pins (un-illustrating) currently formed in the ink feed zone material 65, and carrying out thermal melting arrival of the pin. In addition, few lobes produced in the ink tank 19 side of a base material 45 are stored by having carried out thermal melting arrival of the pin in the hollow (un-illustrating) formed in the side face of the anchoring section of the ink jet unit 18 among the front faces of the ink tank 19. Therefore, trouble is not caused to positioning at the time of attaching the ink jet unit 18 in the ink tank 19.

[0041] Next, the configuration of the ink tank 19 is explained.

[0042] As shown in drawing 4, the ink tank 19 is assembled by closing the ink absorber 71 with the tank lid 72, after consisting of a cartridge body 70, an ink absorber 71 which sinks in and holds ink, and a tank lid 72 and inserting the ink absorber 71 from the opposite side by the side of ink jet unit anchoring section 19a. The ink feed hopper 73 prepared in ink jet unit anchoring section 19a of the ink tank 19 is for supplying ink to the ink jet unit 18, and the filter (un-illustrating) is prepared in the interior of the ink feed hopper 73. Moreover, the atmospheric-air free passage opening 74 for making atmospheric air open the interior for free passage is formed in the ink tank 19, and ***** 75 which prevents that ink is revealed from the atmospheric-air free passage opening 74 is being further inserted and fixed to the atmospheric-air free passage opening 74.

[0043] The configuration of ink jet unit anchoring section 19a of the ink tank 19 is explained using drawing 7 and drawing 4 . Drawing 7 is the perspective view showing ink jet unit anchoring section 19a in the ink tank 19 shown in drawing 4 .

[0044] As shown in drawing 7 and drawing 4 , it sets to ink jet unit anchoring section 19a of the ink tank 19. the delivery 37 of the delivery plate 44 fabricated by the front face of a top plate 42 at one -- almost -- a core -- a passage -- the ink tank 19, if a straight line parallel to the datum level of base 19b is set to L1. On the straight line L1, two projections 47a and 47b which engage with two holes 50 currently formed in the base material 45 are formed. Projections 47a and 47b position the base material 45 to ink jet unit anchoring section 19a, and the height of Projections 47a and 47b is slightly formed low rather than base material 45 thickness.

[0045] Moreover, projections 48 and 49 are formed in ink jet unit anchoring section 19a. Projections 48 and 49 correspond to the holes 51 and 52 for immobilization to ink jet unit anchoring section 19a currently formed in the base material 45, are formed for a long time than Projections 47a and 47b, and fix a base material 45 to ink jet unit anchoring section 19a by carrying out thermal melting arrival of the part which penetrated and projected the base material 45.

[0046] On the straight line L3, if it is perpendicular to a straight line L1 and the line which passes along L3 and projection 49 the straight line which passes along projection 48 is set to L2, since a core is located mostly, the free passage condition of the ink feed hopper 73 and the ink supply pipe 55 is stabilized, and a possibility of the ink feed hopper 73 that a free passage condition may be spoiled by impacts, such as fall of the ink jet cartridge 16, is mitigated. Moreover, since a straight line L2 and a straight line L3 are not in agreement and projections 48 and 49 exist around projection 47a, improvement of the positioning accuracy of the ink jet recording head 17 to ink jet unit anchoring section 19a is achieved. In addition, a curve L4 is the outer wall location of the ink feed zone material 65 when ink jet unit anchoring section 19a is equipped with the ink jet unit 18. The fixed condition is stable and the fixed position of the ink feed zone material 65 seems not to shift easily, since the ink feed zone material 65 is fixed to the location which met mostly the projections 48 and 49 which are fixed parts in this way although weight is concentrating the ink jet unit 18 on the part in which the ink feed zone material 65 is formed.

[0047] Furthermore, the flange 76 prepared in the ink tank 19 is inserted in flange slot 7b (refer to drawing 8) currently formed in carriage 7, and it is prevented that the posture of the ink jet cartridge 16 over carriage 7 gets extremely bad. Moreover, even if the external force which makes the ink jet cartridge 16 secede from carriage 7 according to a certain cause by engaging with the hook section (un-illustrating) which is prepared in ink jet unit anchoring section 19a of the ink tank 19, from which it escapes, and by which the stop 87 is formed in carriage 7 acts, the wearing condition of the ink jet cartridge 16 is maintained.

[0048] As shown in drawing 5 , the ink tank 19 is constituted by covering ink jet unit anchoring section 19a by the covering device material 30 so that the ink jet unit 18 may be surrounded except for lower part opening 16a, after being equipped with the ink jet unit 18. However, since lower part opening 16a is closed by the front face of carriage 7 when the ink jet cartridge 16 is carried in carriage 7, the enclosure 31 which surrounds the ink jet unit 18 depending on the methods of four substantially will be formed.

Therefore, generation of heat from the ink jet unit 18 established in this enclosure 31 is effective as what distributes to homogeneity and keeps the inside of this space warm in this enclosure 31. However, when the ink jet recording device 1 uses it, having carried out long duration continuation, few temperature ups may be produced in an enclosure 31. For this reason, equalization of the temperature distribution of the ink jet unit 18 whole is realized, without being influenced by the external environment, forming the slit 78 of width of face smaller than this enclosure 31 in the roof section 77 of the ink tank 19, and preventing the temperature up in an enclosure 31, as shown in drawing 2, in order to help the natural heat dissipation from the ink jet unit 18.

[0049] As shown in drawing 4, inside the ink jet cartridge 16 Ink the hole 56 of the ink feed hopper 73 and a base material 45 from the interior of the cartridge body 70 A passage, After being supplied in the ink feed zone material 65 through the inlet established in the inside rear-face side of the ink feed zone material 65 and passing along the interior of the ink feed zone material 65, it flows into the common liquid room 41 (refer to drawing 3) through the ink receiving window 43 of a top plate 42. The closure members 79 which consist of silicon, isobutylene isoprene rubber, etc., such as packing and an O ring, are arranged, the closure is performed in the connection of the supply way of the above ink by this, and an ink supply way is secured to it.

[0050] As mentioned above, respectively, since the ink feed zone material 65, a top plate 42, and the cartridge bodies 70 are really shaping components, they are cheap and are very effective in upgrading of not only being formed highly but mass production method. [of dimensional accuracy] Moreover, since components mark are decreasing compared with the former, the outstanding property [exhausting] can be demonstrated certainly.

[0051] As return and the assembled ink jet cartridge 16 are shown at drawing 2, the clearance 81 is formed at explanation of the ink jet cartridge 16 whole between the top-face section 80 of the ink feed zone material 65, and the edge of the roof section 77 in which the slit 78 of the ink tank 19 was formed. Similarly, the clearance (un-illustrating) is formed also between the inferior-surface-of-tongue section 82 (refer to drawing 4) of the ink feed zone material 65, and the sheet metal member 83 (refer to drawing 7) prepared in the lower part of ink jet unit anchoring section 19a of the ink tank 19. These clearances have prevented that external force carries out a direct action to the ink jet unit 18 by absorbing the unnecessary external force which acts on the ink jet cartridge 16 while assisting the heat dissipation effectiveness in a slit 78.

[0052] Next, the configuration of the carriage 7 in the ink jet recording apparatus 1 of this operation gestalt is explained. Drawing 8 R> 8 is the perspective view showing the whole ink jet cartridge configuration shown in the carriage and drawing 2 of the ink jet recording apparatus shown in drawing 1.

[0053] As explained using drawing 1, carriage 7 moves in accordance with the shaft orientations of a platen roller 11. As shown in drawing 8, dark room 7a is prepared in the part which counters a platen roller 11 (refer to drawing 1) at carriage 7. Flange slot 7b in which the flange 76 (reference, such as drawing 2) prepared in the outer wall of the ink jet cartridge 16 is inserted is formed in dark room 7a.

[0054] Moreover, the support plate 8 for electrical connection is formed in carriage 7. The flexible sheet 85 which has the pad 84 corresponding to the pad 61 of the wiring substrate 46 is formed in the field which meets the wiring substrate 46 when equipped with the ink jet cartridge 16 among the front faces of a support plate 8. In addition, the

rear face of the flexible sheet 85 is equipped with the rubber slab sheet (un-illustrating) which has the heights which press each pad 84 from a background. On the other hand, when equipped with the ink jet cartridge 16 among the front faces of a support plate 8, notch 8a for avoiding interference with the projection member 34 is formed in the part along which the projection member 34 prepared in the covering device material 30 of the ink jet cartridge 16 passes.

[0055] Furthermore, carriage 7 is equipped with hook 9a for fixing the ink jet cartridge 16. Hook 9a is prepared free [rotation] to fixed shaft 9c prepared in the hook susceptor 9 for supporting hook 9a, and hook side 9b which engages with the claw part 36 of the ink jet cartridge 16 is formed at the tip of hook 9a.

[0056] Next, the process in which the carriage of an ink jet recording apparatus is equipped with an ink jet cartridge is explained.

[0057] First, the case where an ink jet cartridge and an ink jet recording device are right combination is explained using drawing 8 and drawing 9 . Here, when an ink jet cartridge and an ink jet recording apparatus are right combination, the case where the ink jet recording apparatus 1 and the ink jet cartridge 16 which were explained above are combined is said.

[0058] Drawing 9 is the plan showing the condition of equipping the carriage in the ink jet recording apparatus of right combination with the ink jet cartridge shown in drawing 2 . In addition, in drawing 9 , only the support plate 8 of the ink jet cartridge 16 and carriage 7 is shown, and the roof section 77 (refer to drawing 2) of an ink tank omits, and is drawn.

[0059] As shown in drawing 8 , the field which has lower part opening 16a of the ink jet cartridge 16 is made to meet the front face of carriage 7, and lower part opening 16a is inserted in the support plate 8 of carriage 7. Since notch 8a is prepared in the support plate 8 as shown in drawing 8 and drawing 9 , a support plate 8 does not interfere in the projection member 34 prepared in the ink jet cartridge 16, and carriage 7 is normally equipped with the ink jet cartridge 16.

[0060] If carriage 7 is equipped with the ink jet cartridge 16 and the base of the ink jet cartridge 16 touches the front face of carriage 7, the flange 76 of the ink jet cartridge 16 will be inserted in flange slot 7b currently formed in dark room 7a of carriage 7.

Subsequently, when hook 9a with which carriage 7 is equipped is rotated and hook side 9b is made to engage with the claw part 36 of the ink jet cartridge 16, the ink jet cartridge 16 is fixed to carriage 7.

[0061] Since the pressure welding of the wiring substrate 46 of the ink jet cartridge 16 is carried out to the flexible sheet 85 of a support plate 8 at this time, the pad 84 of the flexible sheet 85 and the pad 61 of the wiring substrate 46 will be contacted. Thereby, a record signal comes to be transmitted to the ink jet cartridge 16 from the ink jet recording apparatus 1. In addition, since the rear face of the flexible sheet 85 is equipped with the rubber slab sheet (un-illustrating) which has the heights which press each pad 84 from a background, the increase of the contact pressure between each pad 61 and 84 and a contact condition are stable.

[0062] In addition, when the ink jet recording apparatus 1 and the ink jet cartridge 16 are equipped with an electric discernment means to identify incorrect wearing of an ink jet cartridge, the purport by which the display panel (un-illustrating) of the ink jet recording apparatus 1 was correctly equipped with the ink jet cartridge is indicated.

[0063] Next, the case where it is the combination which the ink jet cartridge and the ink jet recording device mistook is explained using drawing 10 and drawing 11. Here, the case where it is the mistaken combination means the case where an ink jet cartridge and the ink jet recording device which cannot be used even if it equips with the ink jet cartridge are put together.

[0064] The perspective view showing the condition of equipping with drawing 10 the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 2 was mistaken, and drawing 11 are the plans showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 2 R> 2 was mistaken. In addition, in drawing 11, only the support plate 108 of the ink jet cartridge 16 and carriage 107 is shown, and the roof section 77 (refer to drawing 2) of the ink tank 19 omits, and is drawn.

[0065] As shown in drawing 10 and drawing 11, the notch for preventing interference with the projection member 34 of the ink jet cartridge 16 is not prepared in the support plate 108 in the mistaken ink jet recording apparatus of combination. In addition, the disruptive strength of the projection member 34 is set up smaller than the disruptive strength of a support plate 108. In addition, since each part of carriage 107 is the same as the carriage 7 shown in drawing 8, detailed explanation is omitted.

[0066] Thus, since the projection member 34 of the ink jet cartridge 16 contacts the top face of a support plate 108 as shown in drawing 11 in being the combination which the ink jet cartridge 16 and the ink jet recording apparatus mistook, carriage 107 cannot be equipped with the ink jet cartridge 16.

[0067] When the ink jet cartridge 16 is stuffed into carriage 107 by force, since the projection member 34 prepared in the rear face of the covering device material 30 before a support plate 108 is damaged since it is set up smaller than the disruptive strength of a support plate 108 is damaged and carriage 107 is equipped with the ink jet cartridge 16, the components by the side of an ink jet recording device should not damage the disruptive strength of the projection member 34. Moreover, a user can be made to recognize that it is incorrect wearing by a feel and an acoustic sense in case the projection member 34 is damaged. Although the projection member 34 of the ink jet cartridge 16 of this operation gestalt is formed so that it may damage by the load of about 5 kgf(s), it may change the disruptive strength of the projection member 34 according to amelioration of amelioration of the reinforcement of a support plate 108, a feel in case the projection member 34 is damaged, or an acoustic sense.

[0068] Moreover, when the ink jet recording apparatus and the ink jet cartridge 16 are equipped with an electric discernment means to identify incorrect wearing of an ink jet cartridge, the purport by which carriage 107 was equipped with the ink jet cartridge 16 of the mistaken combination is indicated to the display panel (un-illustrating) of an ink jet recording apparatus. Therefore, although it is after wearing even when it equips with the ink jet cartridge 16 and a user has not recognized that it is incorrect wearing, it can know that it is incorrect wearing.

[0069] In addition, even if it is the ink jet cartridge 16 damaged by incorrect wearing, a breakage is only the projection member 34, and since the ink jet recording head 17 or the ink jet unit 18 of the ink jet cartridge 16 are not influenced at all even if the projection member 34 is damaged, the function which the ink jet cartridge 16 has, i.e., the ink regurgitation function of the ink jet recording head 17, the ink hold function of the ink

tank 19, etc. are not spoiled. Therefore, if the ink jet recording device of right combination is equipped with the ink jet cartridge 16, it can be used that there is no trouble in any way.

[0070] As mentioned above, the projection member 34 as an incorrect wearing prevention means is formed in the ink jet cartridge 16, and since the projection member 34 is damaged before destroying an ink jet recording apparatus side even if it is the case where it equips with the ink jet cartridge 16 of the combination which was mistaken in the ink jet recording apparatus by force, an ink jet recording apparatus is not damaged.

[0071] Moreover, the projection member 34 can be used that there is no trouble in any way, if the ink jet recording device of right combination is equipped with the ink jet cartridge 16 even when it has been made to incorrect-equip with the ink jet cartridge 16 once since it is prepared in the part which does not affect the essential record function of the ink jet cartridge 16 even if the projection member 34 is damaged.

[0072] Next, the application of the ink jet cartridge of this operation gestalt is shown in drawing 12 and drawing 13. The perspective view showing the application of the ink jet cartridge which showed drawing 12 to drawing 6 from drawing 2, and drawing 13 are the perspective views showing the rear face of covering device material shown in drawing 12.

[0073] As shown in drawing 12 and drawing 13, in the ink jet cartridge 116 of this application, the projection member 134 is formed in the covering device material 130 as an outer wall member in the shape of a rectangular parallelepiped. The covering device material 130 is formed with Noryl resin, and, as for the magnitude of the projection member 134, this application is also formed in height of about 3mm, **** of 4mm, and die length of about 10mm. In addition, since each configuration of the ink jet cartridge 116 is the same as the ink jet cartridge 16 explained with reference to drawing 6 from drawing 2, detailed explanation is omitted.

[0074] Then, the process in which the carriage 207 of an ink jet recording apparatus is equipped with the ink jet cartridge 116 is explained. However, since it is the same as that of the case where the case where the ink jet cartridge 116 and an ink jet recording device are right combination is explained using drawing 8 and drawing 9, explanation is omitted.

[0075] Drawing 14 is the perspective view showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 12 was mistaken. In addition, since the configuration of each part of carriage 207 is the same as the carriage 7 shown in drawing 8, detailed explanation is omitted.

[0076] Thus, since the projection member 134 of the ink jet cartridge 116 contacts the top face of a support plate 208 as explained using drawing 11 in being the combination which the ink jet cartridge 116 and the ink jet recording apparatus mistook, carriage 207 cannot be equipped with the ink jet cartridge 116.

[0077] When the ink jet cartridge 116 is stuffed into a support plate 208 by force, in the ink jet cartridge 116 of this application, the projection member 134 of the covering device material 130 is not damaged, but by the thermal melting start stage as a fixed means from which it can be desorbed, caulking immobilization of the welding section 132,133 which is fixing the covering device material 130 to the ink jet cartridge 116 should separate, and the covering device material 130 should be desorbed from the ink jet

cartridge 116. Since the disruptive strength of the welding section 132,133 of the covering device material 130 is set as reinforcement which is desorbed from the ink jet cartridge 116 before a support plate 208 is damaged, the components by the side of an ink jet recording device do not damage it. Thus, a user can be made to recognize clearly that it is incorrect wearing compared with the case where only the projection member which is a part of covering device material damaged and ****s, when the covering device material 130 ****s.

[0078] Drawing 15 is the plan showing the covering device material and welding pin of the ink jet cartridge shown in drawing 12, and its A-A line sectional view. In the welding section 132,133 of the covering device material 130 in the ink jet cartridge 116, the welding pin 186 of a circular cross section as shown in drawing 15 is used. If the welding pin 186 of a circular cross section is crushed with heat, the perimeter of the welding pin 186 will weld to the pin hole 135 of the covering device material 130. However, when the perimeter of the welding pin 186 welds, the desorption reinforcement of the covering device material 130 becomes large, and when the ink jet recording apparatus of combination by which the ink jet cartridge 116 was mistaken is equipped, there is a possibility of damaging an ink jet recording apparatus, without the covering device material 130 ****ing. Then, a work which weakens intentionally reinforcement of the welding section of the covering device material 130 is carried out by making low welding temperature which melts the welding pin 186, or shortening welding time amount.

[0079] Moreover, when the ink jet recording apparatus is equipped with an electric discernment means to identify incorrect wearing of an ink jet cartridge, the purport by which carriage 207 was equipped with the ink jet cartridge 116 of the mistaken combination is indicated to the display panel (un-illustrating) of an ink jet recording apparatus. Therefore, although it is after wearing even when it equips with the ink jet cartridge 116 and a user has not recognized that it is incorrect wearing, it can know that it is incorrect wearing.

[0080] in addition, the function which the ink jet cartridge 116 has even if it is the ink jet cartridge 116 from which the covering device material 130 was desorbed by incorrect wearing, i.e., ink regurgitation machine ** of an ink jet recording head, -- the ink hold function of an ink tank etc. is not spoiled a little. Therefore, if the ink jet recording device of right combination is equipped with the ink jet cartridge 116, it can be used that there is no trouble in any way.

[0081] As mentioned above, since the covering device material 130 as an outer wall member which is the outer wall of the ink jet cartridge 116 ****s before it destroys an ink jet recording apparatus side even if it is the case where an ink jet recording apparatus is equipped with the ink jet cartridge 116 which is not right combination by force, an ink jet recording apparatus is not damaged. Furthermore, a user can be made to recognize clearly that it is incorrect wearing because the covering device material 130 which is some outer walls of the ink jet cartridge 116 ****s.

[0082] In addition, the fixed means of the covering device material 130 to the ink jet cartridge 116 is not restricted to the above-mentioned thermal melting start stage. For example, you may be an adhesion means to fix the welding pin 186 to the pin hole 135 of covering device material using the adhesives of optimum dose, and to fix the covering device material 130 to the ink jet cartridge 116. Moreover, you may be an attachment means to fix the covering device material 130 to the ink jet cartridge 116, by only a few's

forming the outer diameter of the welding pin 186 thickly rather than the pin hole 135, and making the welding pin 186 and the pin hole 135 attach. Furthermore, the front faces of the ink jet cartridge 116 and the covering device material 130 may be fixed using a thermal melting start stage or an adhesion means, without forming the welding pin 186 and the pin hole 135.

[0083] Next, the further application of the ink jet cartridge shown in drawing 15 is shown in drawing 16. Drawing 16 is the plan showing the covering device material and welding pin in the further application of the ink jet cartridge shown in drawing 15, and its A-A line sectional view.

[0084] As shown in drawing 16, the configuration of the welding pin 286 may be formed so that a cross section may become an abbreviation cross-joint form. By making the cross-section configuration of the welding pin 286 into an abbreviation cross-joint form, since the welding area of the pin hole 235 of the covering device material 230 and the welding pin 286 becomes small, the welding reinforcement of the welding section 232,233 becomes small, and the desorption reinforcement of the covering device material 230 can be stopped low. Even if it does not make strict welding conditions, such as welding temperature at the time of melting the welding pin 286, and welding time amount, by this, caulking immobilization of the covering device material 230 can be carried out with the value near desired desorption reinforcement at the ink jet cartridge 216.

[0085] Thus, by making the cross-section configuration of the welding pin 286 into an abbreviation cross-joint form, since dispersion in the desorption reinforcement of the covering device material 230 is suppressed, the covering device material 230 can be more certainly desorbed at the time of incorrect wearing of the ink jet cartridge 216.

[0086]

[Effect of the Invention] As explained above, the ink jet cartridge of this invention Even if it equips, when it is going to equip the ink jet recording device which cannot be used An incorrect wearing prevention means to prevent incorrect wearing to an ink jet recording apparatus by interfering with some ink jet recording apparatus is established. The disruptive strength of an incorrect wearing prevention means Since it is set up smaller than the disruptive strength of the member in which an incorrect wearing prevention means interferes, even if it is the case where an ink jet recording apparatus is equipped with the ink jet cartridge which is not right combination by force, an ink jet recording apparatus is not damaged.

[0087] Moreover, an incorrect wearing prevention means can make a user recognize that it is incorrect wearing by a feel and an acoustic sense in case a projection member is damaged by being a projection member.

[0088] Furthermore, an incorrect wearing prevention means can make a user recognize clearly that it is incorrect wearing compared with the case where only a projection member damages and ****s, by setting up smaller than the disruptive strength of the member in which an incorrect wearing prevention means interferes the disruptive strength of the fixed part of an outer wall member and an ink tank including the outer wall member fixed to the ink tank possible [desorption].

[0089] Moreover, even if an incorrect wearing prevention means is destroyed by incorrect wearing by being arranged in the location which does not spoil the function which said ink jet cartridge has even if an incorrect wearing prevention means is

destroyed, if the function which an ink jet cartridge has is not spoiled but the ink jet recording device of right combination is equipped with an ink jet cartridge, it can be used that there is no trouble in any way.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the ink jet cartridge with which the ink jet recording apparatus which breathes out ink and records an image on recorded media is equipped.

PRIOR ART

[Description of the Prior Art] With the recording device used as output units, such as a computer, and a word processor, a workstation, or the recording device used as an output means of a copying machine or facsimile, it is an image (an alphabetic character and a notation are included.). It is below the same. Based on the image information inputted into the recording device, it is recorded on recorded media including plastics sheet metal, such as a record form or an OHP sheet.

[0003] The so-called ink jet recording apparatus is in one of such the recording apparatus. An ink jet recording apparatus is a recording apparatus which breathes out ink to recorded media from the nozzle prepared in the ink jet recording head, and records an image on recorded media. Since it is that a highly precise image is recordable at high speed, that it is recordable on the regular paper by which special processing is not made, and a non impact type as an advantage of an ink jet recording device, it is known that the noise at the time of record is small, that it is easy to record a color picture using further multicolor ink, that the miniaturization of an ink jet recording head is easy, etc.

[0004] by the way, the thing of a configuration of that the ink tank was connected to the ink supply means to the ink jet recording head in an ink jet recording apparatus through the tube etc. at the ink jet recording head -- or there is a thing of various gestalten, such as a thing using the ink jet cartridge with which the ink jet recording head and the ink tank were united. Among those, for example it is carried in U.S. Pat. No. 4771295 (JP,63-84239,A) removable to a recording apparatus, and it is an exchangeable ink jet cartridge, and fills up with an ink absorber in an ink tank about an ink jet cartridge, and what is infiltrating ink into the ink absorber is indicated. In addition, such an ink jet cartridge is already marketed widely.

[0005] On the other hand, recently, the nozzle of an ink jet recording head is arranged more by high density, and record of a high definition image is attained. For example, the color picture record not only using alphabetic character record but the color ink only using black ink and record of a still high definition photograph tone image are also attained. The thing not only using what the class of ink used with a recording device was also becoming various in connection with this, for example, melted the color to the drainage system solvent about black ink but a pigment, the thing which has a water resisting property even if it is a color are used. About color ink, moreover, by making light concentration of each color of not only the ink of mere yellow, MAZENDA, and

cyanogen but ink Gradation nature is given to the lightness between the monochrome part in a record image, and the part which two or more colors piled up, and red, Green, and blue ink are also used for the ink of the yellow which can acquire more nearly high-definition record image quality, MAZENDA, and cyanogen, and a pan. The class of ink jet cartridge is increasing according to such a background, and the class of ink jet recording device is also increasing that it should correspond to each ink jet cartridge.

[0006] By the way, since many components are communalized in order that an ink jet cartridge and an ink jet recording device may aim at reduction of a production cost, and compaction of a development cycle, the configuration is similar for various kinds. Then, an ink jet recording apparatus and it can be equipped, and user support is performed by explanation at a shop front, and a catalog and an operation manual about combination with an ink jet cartridge recordable good. However, there is not no possibility that a user will equip with the ink jet cartridge which does not support an ink jet recording apparatus accidentally. When equipped with the ink jet cartridge which does not support an ink jet recording apparatus, since drive conditions differ, in the printer driver with which the ink jet recording apparatus is equipped, the case where record is not carried out at all by the difference in the discharge quantity of an ink class or ink, the difference in a nozzle consistency, etc., or a normal image is not recorded may be generated.

[0007] Then, in order to prevent such a situation, at least one side of an ink jet recording apparatus and an ink jet cartridge is equipped with the discernment means for identifying whether it is incorrect wearing. While preparing heights in an electric discernment means identify incorrect wearing by reading with a signal reading means to by_ which the recognition signal given to the ink-jet cartridge is established as a discernment means at the ink-jet recording device side, and an ink-jet cartridge, in an ink-jet recording device, the crevice into which the heights of an ink-jet cartridge fit establishes, and there is a structural discernment means identify incorrect wearing in it, in the mistaken combination by being unable to equip an ink-jet recording device with an ink-jet cartridge, and carrying out it.

[0008] Among the above-mentioned discernment means, with an electric discernment means, after being equipped with an ink jet cartridge, it is identified whether it was incorrect wearing. However, the delivery side of the nozzle of an ink jet cartridge is protected to an ink jet recording apparatus, or the capping means for attracting ink is formed in it from the nozzle, and the ink of an ink jet cartridge with which the ink jet recording apparatus was equipped before remains in this capping means somewhat. Therefore, if a KYAPINGU means contacts the nozzle of the ink jet cartridge with which it was newly equipped, heterogeneous ink will be mixed on the front face of a nozzle and a capping means. thus, the cause of fixing of ink being promoted if heterogeneous ink is mixed -- especially, with the nozzle of an ink jet recording head, since ink is not normally breathed out until the ink which fixed after starting record is removed, the recorded image may become blurred When fixing of ink progresses further, the nozzle of an ink jet recording head is got blocked, or it is considered that a capping means also stops functioning normally.

[0009] On the other hand, among the above-mentioned discernment means, with the structural discernment means, only when the heights prepared in the ink jet cartridge and the crevice established in the ink jet recording apparatus are the cases where an ink jet cartridge and a recording apparatus are right combination, it is prepared so that it can fit

in and equip. Thereby, since incorrect wearing of an ink jet cartridge can be prevented beforehand, heterogeneous ink is not mixed as mentioned above.

[0010] So, the above-mentioned structural discernment means is widely used for the discernment means of incorrect wearing of an ink jet cartridge.

EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, the ink jet cartridge of this invention Even if it equips, when it is going to equip the ink jet recording device which cannot be used An incorrect wearing prevention means to prevent incorrect wearing to an ink jet recording apparatus by interfering with some ink jet recording apparatus is established. The disruptive strength of an incorrect wearing prevention means Since it is set up smaller than the disruptive strength of the member in which an incorrect wearing prevention means interferes, even if it is the case where an ink jet recording apparatus is equipped with the ink jet cartridge which is not right combination by force, an ink jet recording apparatus is not damaged.

[0087] Moreover, an incorrect wearing prevention means can make a user recognize that it is incorrect wearing by a feel and an acoustic sense in case a projection member is damaged by being a projection member.

[0088] Furthermore, an incorrect wearing prevention means can make a user recognize clearly that it is incorrect wearing compared with the case where only a projection member damages and ****s, by setting up smaller than the disruptive strength of the member in which an incorrect wearing prevention means interferes the disruptive strength of the fixed part of an outer wall member and an ink tank including the outer wall member fixed to the ink tank possible [desorption].

[0089] Moreover, even if an incorrect wearing prevention means is destroyed by incorrect wearing by being arranged in the location which does not spoil the function which said ink jet cartridge has even if an incorrect wearing prevention means is destroyed, if the function which an ink jet cartridge has is not spoiled but the ink jet recording device of right combination is equipped with an ink jet cartridge, it can be used that there is no trouble in any way.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the case where the above-mentioned structural discernment means is used, in spite of being the combination which the ink jet recording apparatus and the ink jet cartridge mistook, when unreasonableness has been equipped with the ink jet cartridge, with a user not noticed, at least one side will be damaged among an ink jet recording apparatus and an ink jet cartridge. When an ink jet cartridge side is damaged, if the ink jet cartridge of another normal is prepared, it can record immediately. However, when an ink jet recording apparatus side is damaged, it will be necessary to fix an ink jet recording apparatus, the burden which a user receives since it becomes impossible to use an ink jet recording apparatus is large during a repair period, and the breakage by the side of an ink jet recording apparatus is not desirable.

[0012] Then, this invention aims at offering the ink jet cartridge which has the incorrect wearing prevention means which does not damage an ink jet recording apparatus even if it is the case where an ink jet recording apparatus is equipped with the ink jet cartridge which is not right combination by force.

MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the ink jet cartridge of this invention The ink jet recording head section which breathes out ink and records on recorded media, It is the ink jet cartridge by which the ink tank which holds the ink supplied to said ink jet recording head section is united, is constituted, and an ink jet recording apparatus is equipped with it. Even if it equips, when it is going to equip the ink jet recording device which cannot be used An incorrect wearing prevention means to prevent incorrect wearing to said ink jet recording apparatus by interfering with said some of ink jet recording apparatus is established. The disruptive strength of said incorrect wearing prevention means It is set up smaller than the disruptive strength of the member of the ink jet recording device in which said incorrect wearing prevention means interferes.

[0014] Even if it should equip, when the ink jet recording apparatus which cannot be used is equipped with an ink jet cartridge by force by this, before the part in which an incorrect wearing prevention means interferes among the members in an ink jet recording apparatus is damaged, the incorrect wearing prevention means of an ink jet cartridge is damaged.

[0015] Moreover, when said incorrect wearing prevention means is a projection member, it is recognized by the user by a feel and an acoustic sense in case a projection member is damaged that it is incorrect wearing.

[0016] Furthermore, said incorrect wearing prevention means contains the outer wall member fixed to said ink tank possible [description]. By setting up smaller than the disruptive strength of the member in which said incorrect wearing prevention means interferes the disruptive strength of the fixed part of said outer wall member and said ink tank Even if it should equip, when the ink jet recording apparatus which cannot be used is equipped with an ink jet cartridge by force, an outer wall member is desorbed from an ink tank. Therefore, compared with the case where only a projection damages and ****s, it is clearly recognized by the user that it is incorrect wearing.

[0017] In addition, as for said outer wall member, it is desirable to be fixed to said ink tank by the thermal melting start stage, the adhesion means, or the attachment means.

[0018] Moreover, even if said incorrect wearing prevention means is the ink jet cartridge by which the incorrect wearing prevention means was destroyed by incorrect wearing by being arranged in the location which does not spoil the function which said ink jet cartridge has even if destroyed, the function which an ink jet cartridge has is not spoiled.

[0019]

[Embodiment of the Invention] Next, the operation gestalt of this invention is explained with reference to a drawing.

[0020] The outline of 1 operation gestalt of an ink jet recording device in which first use drawing 1 and the ink jet cartridge of this invention is used is explained. Drawing 1 is the

perspective view showing the outline configuration of 1 operation gestalt of the ink jet recording device with which the ink jet cartridge of this invention is used.

[0021] As shown in drawing 1, the leading screw 2 by which spiral slot 2a was minced is supported by the ink jet recording device 1 free [rotation]. Through the driving force transfer gear 6 prepared in the leading screw 2, and the driving force transfer gear 5 which is bit and put together and is prepared in the driving force transfer gear 6, a leading screw 2 is interlocked with the forward inverse rotation of a drive motor 4, and is rotated. Moreover, the pin (un-illustrating) prepared in the part which supports a leading screw 2 engages with spiral slot 2a, and the carriage 7 with which the ink jet cartridge 16 is carried is formed free [sliding] to the leading screw 2 and the guide rail 3. Since the forward inverse rotation of a drive motor 4 is interlocked with and a pin is guided to spiral slot 2a by this, carriage 7 moves in accordance with the shaft orientations (X shaft orientations of illustration) of a platen roller 11. Paper feed of the recorded media 10, such as a record form and plastics sheet metal, is carried out by the platen roller 11. In addition, in the range which meets the ink jet recording head (un-illustrating) of the ink jet cartridge 16 among the front faces of recorded media 10, it is formed more broadly than a platen roller 11, and recorded media 10 are pressed by the peripheral surface of a platen roller 11 with the paper bail plate 12 formed along the migration direction of carriage 7.

[0022] Moreover, the ink jet recording apparatus 1 is equipped with photo couplers 13 and 14 as a home-position detection means for detecting passage of the lever 15 prepared in carriage 7, and performing the change of the hand of cut of a drive motor 4 etc. Furthermore, in the location (for example, home position) from which the ink jet recording head of the ink jet cartridge 16 separated from the record section, the capping means 20 of a wrap (capping) sake is arranged in the location which meets an ink jet recording head in the ink delivery side of an ink jet recording head. The KYAPINGU means 20 is supported by the supporter material 21, it has a suction means 22 to attract ink from the ink delivery of an ink jet recording head further, and suction recovery of an ink jet recording head is performed by attracting the ink delivery of an ink jet recording head through the opening 23 in a cap.

[0023] The cleaning blade 26 which the support plate material 25 is attached and was supported by the support plate material 25 possible [sliding] is formed in Y shaft orientations of illustration movable by the driving means (un-illustrating), and cleaning of an ink jet recording head is performed in the frame part material 24 of the ink jet recording device 1 by contacting and estranging to an ink jet recording head.

[0024] The cam 28 is formed in the location which contacts when it moves to a location with carriage 7. The lever 27 is formed so that it may interlock and may carry out movable to the cam 28 moved to carriage 7. In connection with a motion of a lever 27, transfer of the driving force from a drive motor 4 is controlled by controlling the power means of communication of common knowledge, such as a gear 29 and a clutch (un-illustrating).

[0025] When carriage 7 moves to a home-position field, alignment of each processing stroke of the above-mentioned capping, suction recovery, and cleaning is carried out to the location where an ink jet recording head meets the opening 23 in a cap, or a cleaning blade 26, and it is performed. These each processing stroke and alignment strokes of an ink jet recording head can be performed in the mode of arbitration using well-known

timing and a well-known sequence. Moreover, each of these processing strokes may be performed independently and may be performed complexly.

[0026] In addition, the ink jet recording apparatus 1 may be equipped with an electric discernment means to identify incorrect wearing, by reading with a signal reading means by which the recognition signal given to the ink jet cartridge 16 is established at the ink jet recording apparatus 1 side.

[0027] Next, the configuration of 1 operation gestalt of the ink jet cartridge of this invention is explained. The perspective view in which drawing 2 shows the whole 1 operation gestalt configuration of the ink jet cartridge of this invention, the fluoroscopy perspective view of the ink jet recording head in the ink jet cartridge which showed drawing 3 to drawing 2 , and drawing 4 R> 4 are the decomposition perspective views of the ink jet cartridge shown in drawing 2 .

[0028] As shown in drawing 2 and drawing 4 , the ink jet cartridge 16 has the structure where the ink jet unit 18 equipped with the ink jet recording head 17 and the ink tank 19 which holds ink were attached to one.

[0029] The perspective view shown where drawing 5 is seen from [which showed the ink jet cartridge shown in drawing 2 to drawing 2] A, and drawing 6 are the perspective views showing the rear face of covering device material shown in drawing 5 .

[0030] As shown in drawing 5 , the covering device material 30 forms the enclosure 31 which surrounds and contains the ink jet unit 18 between the ink tanks 19 while being some outer walls of the ink jet cartridge 16. Moreover, the claw part 36 which engages with hook 9a (refer to drawing 8) of the carriage 7 mentioned later is formed in the ink jet cartridge 16. The covering device material 30 is being fixed to the ink tank 19 in the two welding sections 32 and 33. In addition, as shown in drawing 5 and drawing 6 , the projection member 34 as an incorrect wearing prevention means to prevent incorrect wearing to the mistaken ink jet recording device of combination is formed in the rear face of the covering device material 30. Moreover, as shown in drawing 6 , the pin hole 35 is formed in the welding sections 32 and 33 at the covering device material 30. Two welding pins (un-illustrating) prepared in the ink tank 19 are inserted in two pin holes 35 of the covering device material 30, respectively, and caulking immobilization of the covering device material 30 is carried out to the ink tank 19 by crushing the head of a welding pin by heat. With this operation gestalt, the covering device material 30 is formed with Noryl resin, and the magnitude of the projection member 34 is formed in about 0.5mm in height of about 3mm, 4mm of ****, and thickness. In addition, the molding material of the covering device material 30, the configuration of the projection member 34, and a dimension are not limited above.

[0031] Then, the configuration of the ink jet recording head 17 is explained.

[0032] As shown in drawing 3 , two or more deliveries 37 are established in seriate, and the liquid ink way 39 for supplying ink is arranged in each delivery 37 by the ink jet recording head 17. The electric thermal-conversion object 38 which generates heat energy with the supplied applied voltage as an energy component for making ink breathe out from a delivery 37 is arranged in each liquid ink way 39. By impressing a driving signal to each electric thermal-conversion object 38 alternatively according to a picture signal, ink is made to produce film boiling with the heat energy generated from the electric thermal-conversion object 38, and air bubbles are generated in the liquid ink way 39. By growing up these air bubbles further, an ink droplet is breathed out from a

delivery 37.

[0033] In addition, each electric thermal-conversion object 38 is established on the heater board 40 which consists of a silicon substrate, and is formed in one by the membrane formation technique by semi-conductor manufacture processes, such as etching, vacuum evaporation, and sputtering, with wiring and the electrode (un-illustrating) of the aluminum which supplies power to each electric thermal-conversion object 38. A delivery 37 can manufacture easily by this the ink jet recording head 17 arranged by high density, and much more miniaturization of the ink jet recording head 17 can be attained. Moreover, by utilizing the advantage of IC technique or a micro processing technique, long-picture-izing of the ink jet recording head 17 and shape[of a field]-izing (two-dimensional-izing) are also easy, and the formation of full multi and high-density-assembly-izing of the ink jet recording head 17 are also still easier.

[0034] Moreover, the top plate 42 with which the common liquid room 41 which contains temporarily the septum for classifying each liquid ink way 39 and the ink supplied to each liquid ink way 39, the ink receiving window 43 (refer to drawing 4) for introducing ink into the common liquid room 41 from the ink tank 19, etc. were formed is really fabricated. As a molding material of a top plate 42, although polysulfone is desirable, other molding resin ingredients, such as polyether sulfone, polyphenylene oxide, and polypropylene, may be used.

[0035] Next, the configuration of the ink jet unit 18 is explained.

[0036] As shown in drawing 4 , the metal base material 45 has the holes 50, 51, and 52 which engage with two projections 47a and 47b for positioning prepared in the ink tank 19, and two projections 48 and 49 (projection 49 is referring to drawing 7) for thermal melting arrival maintenance, and also has the projections 53 and 54 for positioning to carriage 7. In addition, a base material 45 is made to penetrate the ink supply pipe 55 mentioned later, and the hole 56 for forming the ink passage from the ink tank 19 is formed. in addition, near the projections 53 and 54 for positioning of a base material 45 Crevices 57 and 58 are formed, respectively. Crevices 57 and 58 In the assembled ink jet cartridge 16 (refer to drawing 2) By being located on the production of the parallel slots 59 and 60 of each plurality formed in three sides around the ink jet unit 18 in the ink jet cartridge 16, it is constituted so that discard, such as dust and ink, may not result in projections 53 and 54.

[0037] The wiring substrate 46 is stuck on the base material 45 by the binder etc. Two or more pads 61 for receiving the electrical signal from the ink jet recording device 1 are formed in the end of the wiring substrate 46, and the wiring part of the heater board 40 which is also the substrate of the ink jet recording head 17 is connected to the other end. Each pad 61 supports each electric thermal-conversion object 38 (refer to drawing 3) prepared in the ink jet recording head 17, and the electrical signal from the ink jet recording device 1 passes along each pad 61, and is supplied to each electric thermal-conversion object 38 according to an individual.

[0038] The pressure spring 62 for fixing the ink jet recording head 17 to a base material 45 is formed in the M character configuration. The heater board 40 and the top plate 42 are arranged between the pressure spring 62 and the base material 45, and the heater board 40 and a top plate 42 are fixed in the condition of having been put between the pressure spring 62 and the base material 45, by making the foot of a pressure spring 62 engage with the rear-face side of a base material 45 through the hole 63 of a base material

45. while the part of the outer wall of the common liquid room 41 (refer to drawing 3) is pressed by the center section of the shape of an M typeface of a pressure spring 62 by light pressure among the outer walls of a top plate 42 at this time -- a pressure spring 62 - front -- the who section 64 -- a part of liquid ink way 39 (refer to drawing 3) of the ink jet recording head 17 -- the intensive press of the about 37-delivery field is preferably carried out with the linear pressure.

[0039] the ink which the ink supply pipe 55 is formed in the ink feed zone material 65 for supplying the ink supplied from the ink tank 19 to the ink jet recording head 17 in the shape of a cantilever, and was connected with the ink supply pipe 55 -- a conduit 66 has - having -- further -- ink -- the closure pin 67 for securing the capillarity between a conduit 66 and the ink supply pipe 55 is inserted. In addition, the closure of the bond part of the ink tank 19 and the ink supply pipe 55 is carried out by press fit.

[0040] Since the ink feed zone material 65 is really fabricated by mold shaping, its dimensional accuracy of each part is high. for example, ink -- since the dimensional accuracy of each part of the ink feed zone material 65 is high, the pressure-welding condition over the ink receiving window 43 of a conduit 66 is stable. here -- ink -- if the adhesives for closure resin are slushed from the ink feed zone material 65 side where the pressure welding of the conduit 66 is carried out to the ink receiving window 43 -- ink -- the more positive free passage condition of a conduit 66 and the ink receiving window 43 can be acquired. Moreover, immobilization of the ink feed zone material 65 to a base material 45 is simply performed by making the holes 68 and 69 of a base material 45 penetrate two pins (un-illustrating) currently formed in the ink feed zone material 65, and carrying out thermal melting arrival of the pin. In addition, few lobes produced in the ink tank 19 side of a base material 45 are stored by having carried out thermal melting arrival of the pin in the hollow (un-illustrating) formed in the side face of the anchoring section of the ink jet unit 18 among the front faces of the ink tank 19. Therefore, trouble is not caused to positioning at the time of attaching the ink jet unit 18 in the ink tank 19.

[0041] Next, the configuration of the ink tank 19 is explained.

[0042] As shown in drawing 4 , the ink tank 19 is assembled by closing the ink absorber 71 with the tank lid 72, after consisting of a cartridge body 70, an ink absorber 71 which sinks in and holds ink, and a tank lid 72 and inserting the ink absorber 71 from the opposite side by the side of ink jet unit anchoring section 19a. The ink feed hopper 73 prepared in ink jet unit anchoring section 19a of the ink tank 19 is for supplying ink to the ink jet unit 18, and the filter (un-illustrating) is prepared in the interior of the ink feed hopper 73. Moreover, the atmospheric-air free passage opening 74 for making atmospheric air open the interior for free passage is formed in the ink tank 19, and ***** 75 which prevents that ink is revealed from the atmospheric-air free passage opening 74 is being further inserted and fixed to the atmospheric-air free passage opening 74.

[0043] The configuration of ink jet unit anchoring section 19a of the ink tank 19 is explained using drawing 7 and drawing 4 . Drawing 7 is the perspective view showing ink jet unit anchoring section 19a in the ink tank 19 shown in drawing 4 .

[0044] As shown in drawing 7 and drawing 4 , it sets to ink jet unit anchoring section 19a of the ink tank 19. the delivery 37 of the delivery plate 44 fabricated by the front face of a top plate 42 at one -- almost -- a core -- a passage -- the ink tank 19, if a straight line parallel to the datum level of base 19b is set to L1 On the straight line L1, two projections

47a and 47b which engage with two holes 50 currently formed in the base material 45 are formed. Projections 47a and 47b position the base material 45 to ink jet unit anchoring section 19a, and the height of Projections 47a and 47b is slightly formed low rather than base material 45 thickness.

[0045] Moreover, projections 48 and 49 are formed in ink jet unit anchoring section 19a. Projections 48 and 49 correspond to the holes 51 and 52 for immobilization to ink jet unit anchoring section 19a currently formed in the base material 45, are formed for a long time than Projections 47a and 47b, and fix a base material 45 to ink jet unit anchoring section 19a by carrying out thermal melting arrival of the part which penetrated and projected the base material 45.

[0046] On the straight line L3, if it is perpendicular to a straight line L1 and the line which passes along L3 and projection 49 the straight line which passes along projection 48 is set to L2, since a core is located mostly, the free passage condition of the ink feed hopper 73 and the ink supply pipe 55 is stabilized, and a possibility of the ink feed hopper 73 that a free passage condition may be spoiled by impacts, such as fall of the ink jet cartridge 16, is mitigated. Moreover, since a straight line L2 and a straight line L3 are not in agreement and projections 48 and 49 exist around projection 47a, improvement of the positioning accuracy of the ink jet recording head 17 to ink jet unit anchoring section 19a is achieved. In addition, a curve L4 is the outer wall location of the ink feed zone material 65 when ink jet unit anchoring section 19a is equipped with the ink jet unit 18. The fixed condition is stable and the fixed position of the ink feed zone material 65 seems not to shift easily, since the ink feed zone material 65 is fixed to the location which met mostly the projections 48 and 49 which are fixed parts in this way although weight is concentrating the ink jet unit 18 on the part in which the ink feed zone material 65 is formed.

[0047] Furthermore, the flange 76 prepared in the ink tank 19 is inserted in flange slot 7b (refer to drawing 8) currently formed in carriage 7, and it is prevented that the posture of the ink jet cartridge 16 over carriage 7 gets extremely bad. Moreover, even if the external force which makes the ink jet cartridge 16 secede from carriage 7 according to a certain cause by engaging with the hook section (un-illustrating) which is prepared in ink jet unit anchoring section 19a of the ink tank 19, from which it escapes, and by which the stop 87 is formed in carriage 7 acts, the wearing condition of the ink jet cartridge 16 is maintained.

[0048] As shown in drawing 5 , the ink tank 19 is constituted by covering ink jet unit anchoring section 19a by the covering device material 30 so that the ink jet unit 18 may be surrounded except for lower part opening 16a, after being equipped with the ink jet unit 18. However, since lower part opening 16a is closed by the front face of carriage 7 when the ink jet cartridge 16 is carried in carriage 7, the enclosure 31 which surrounds the ink jet unit 18 depending on the methods of four substantially will be formed. Therefore, generation of heat from the ink jet unit 18 established in this enclosure 31 is effective as what distributes to homogeneity and keeps the inside of this space warm in this enclosure 31. However, when the ink jet recording device 1 uses it, having carried out long duration continuation, few temperature ups may be produced in an enclosure 31. For this reason, equalization of the temperature distribution of the ink jet unit 18 whole is realized, without being influenced by the external environment, forming the slit 78 of width of face smaller than this enclosure 31 in the roof section 77 of the ink tank 19, and

preventing the temperature up in an enclosure 31, as shown in drawing 2, in order to help the natural heat dissipation from the ink jet unit 18.

[0049] As shown in drawing 4, inside the ink jet cartridge 16 Ink the hole 56 of the ink feed hopper 73 and a base material 45 from the interior of the cartridge body 70 A passage, After being supplied in the ink feed zone material 65 through the inlet established in the inside rear-face side of the ink feed zone material 65 and passing along the interior of the ink feed zone material 65, it flows into the common liquid room 41 (refer to drawing 3) through the ink receiving window 43 of a top plate 42. The closure members 79 which consist of silicon, isobutylene isoprene rubber, etc., such as packing and an O ring, are arranged, the closure is performed in the connection of the supply way of the above ink by this, and an ink supply way is secured to it.

[0050] As mentioned above, respectively, since the ink feed zone material 65, a top plate 42, and the cartridge bodies 70 are really shaping components, they are cheap and are very effective in upgrading of not only being formed highly but mass production method. [of dimensional accuracy] Moreover, since components mark are decreasing compared with the former, the outstanding property [exhausting] can be demonstrated certainly.

[0051] As return and the assembled ink jet cartridge 16 are shown at drawing 2, the clearance 81 is formed at explanation of the ink jet cartridge 16 whole between the top-face section 80 of the ink feed zone material 65, and the edge of the roof section 77 in which the slit 78 of the ink tank 19 was formed. Similarly, the clearance (un-illustrating) is formed also between the inferior-surface-of-tongue section 82 (refer to drawing 4) of the ink feed zone material 65, and the sheet metal member 83 (refer to drawing 7) prepared in the lower part of ink jet unit anchoring section 19a of the ink tank 19. These clearances have prevented that external force carries out a direct action to the ink jet unit 18 by absorbing the unnecessary external force which acts on the ink jet cartridge 16 while assisting the heat dissipation effectiveness in a slit 78.

[0052] Next, the configuration of the carriage 7 in the ink jet recording apparatus 1 of this operation gestalt is explained. Drawing 8 R> 8 is the perspective view showing the whole ink jet cartridge configuration shown in the carriage and drawing 2 of the ink jet recording apparatus shown in drawing 1.

[0053] As explained using drawing 1, carriage 7 moves in accordance with the shaft orientations of a platen roller 11. As shown in drawing 8, dark room 7a is prepared in the part which counters a platen roller 11 (refer to drawing 1) at carriage 7. Flange slot 7b in which the flange 76 (reference, such as drawing 2) prepared in the outer wall of the ink jet cartridge 16 is inserted is formed in dark room 7a.

[0054] Moreover, the support plate 8 for electrical connection is formed in carriage 7. The flexible sheet 85 which has the pad 84 corresponding to the pad 61 of the wiring substrate 46 is formed in the field which meets the wiring substrate 46 when equipped with the ink jet cartridge 16 among the front faces of a support plate 8. In addition, the rear face of the flexible sheet 85 is equipped with the rubber slab sheet (un-illustrating) which has the heights which press each pad 84 from a background. On the other hand, when equipped with the ink jet cartridge 16 among the front faces of a support plate 8, notch 8a for avoiding interference with the projection member 34 is formed in the part along which the projection member 34 prepared in the covering device material 30 of the ink jet cartridge 16 passes.

[0055] Furthermore, carriage 7 is equipped with hook 9a for fixing the ink jet cartridge

16. Hook 9a is prepared free [rotation] to fixed shaft 9c prepared in the hook susceptor 9 for supporting hook 9a, and hook side 9b which engages with the claw part 36 of the ink jet cartridge 16 is formed at the tip of hook 9a.

[0056] Next, the process in which the carriage of an ink jet recording apparatus is equipped with an ink jet cartridge is explained.

[0057] First, the case where an ink jet cartridge and an ink jet recording device are right combination is explained using drawing 8 and drawing 9 . Here, when an ink jet cartridge and an ink jet recording apparatus are right combination, the case where the ink jet recording apparatus 1 and the ink jet cartridge 16 which were explained above are combined is said.

[0058] Drawing 9 is the plan showing the condition of equipping the carriage in the ink jet recording apparatus of right combination with the ink jet cartridge shown in drawing 2 . In addition, in drawing 9 , only the support plate 8 of the ink jet cartridge 16 and carriage 7 is shown, and the roof section 77 (refer to drawing 2) of an ink tank omits, and is drawn.

[0059] As shown in drawing 8 , the field which has lower part opening 16a of the ink jet cartridge 16 is made to meet the front face of carriage 7, and lower part opening 16a is inserted in the support plate 8 of carriage 7. Since notch 8a is prepared in the support plate 8 as shown in drawing 8 and drawing 9 , a support plate 8 does not interfere in the projection member 34 prepared in the ink jet cartridge 16, and carriage 7 is normally equipped with the ink jet cartridge 16.

[0060] If carriage 7 is equipped with the ink jet cartridge 16 and the base of the ink jet cartridge 16 touches the front face of carriage 7, the flange 76 of the ink jet cartridge 16 will be inserted in flange slot 7b currently formed in dark room 7a of carriage 7.

Subsequently, when hook 9a with which carriage 7 is equipped is rotated and hook side 9b is made to engage with the claw part 36 of the ink jet cartridge 16, the ink jet cartridge 16 is fixed to carriage 7.

[0061] Since the pressure welding of the wiring substrate 46 of the ink jet cartridge 16 is carried out to the flexible sheet 85 of a support plate 8 at this time, the pad 84 of the flexible sheet 85 and the pad 61 of the wiring substrate 46 will be contacted. Thereby, a record signal comes to be transmitted to the ink jet cartridge 16 from the ink jet recording apparatus 1. In addition, since the rear face of the flexible sheet 85 is equipped with the rubber slab sheet (un-illustrating) which has the heights which press each pad 84 from a background, the increase of the contact pressure between each pad 61 and 84 and a contact condition are stable.

[0062] In addition, when the ink jet recording apparatus 1 and the ink jet cartridge 16 are equipped with an electric discernment means to identify incorrect wearing of an ink jet cartridge, the purport by which the display panel (un-illustrating) of the ink jet recording apparatus 1 was correctly equipped with the ink jet cartridge is indicated.

[0063] Next, the case where it is the combination which the ink jet cartridge and the ink jet recording device mistook is explained using drawing 10 and drawing 11 . Here, the case where it is the mistaken combination means the case where an ink jet cartridge and the ink jet recording device which cannot be used even if it equips with the ink jet cartridge are put together.

[0064] The perspective view showing the condition of equipping with drawing 10 the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge

shown in drawing 2 was mistaken, and drawing 11 are the plans showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 2 R> 2 was mistaken. In addition, in drawing 11, only the support plate 108 of the ink jet cartridge 16 and carriage 107 is shown, and the roof section 77 (refer to drawing 2) of the ink tank 19 omits, and is drawn.

[0065] As shown in drawing 10 and drawing 11, the notch for preventing interference with the projection member 34 of the ink jet cartridge 16 is not prepared in the support plate 108 in the mistaken ink jet recording apparatus of combination. In addition, the disruptive strength of the projection member 34 is set up smaller than the disruptive strength of a support plate 108. In addition, since each part of carriage 107 is the same as the carriage 7 shown in drawing 8, detailed explanation is omitted.

[0066] Thus, since the projection member 34 of the ink jet cartridge 16 contacts the top face of a support plate 108 as shown in drawing 11 in being the combination which the ink jet cartridge 16 and the ink jet recording apparatus mistook, carriage 107 cannot be equipped with the ink jet cartridge 16.

[0067] When the ink jet cartridge 16 is stuffed into carriage 107 by force, since the projection member 34 prepared in the rear face of the covering device material 30 before a support plate 108 is damaged since it is set up smaller than the disruptive strength of a support plate 108 is damaged and carriage 107 is equipped with the ink jet cartridge 16, the components by the side of an ink jet recording device should not damage the disruptive strength of the projection member 34. Moreover, a user can be made to recognize that it is incorrect wearing by a feel and an acoustic sense in case the projection member 34 is damaged. Although the projection member 34 of the ink jet cartridge 16 of this operation gestalt is formed so that it may damage by the load of about 5 kgf(s), it may change the disruptive strength of the projection member 34 according to amelioration of amelioration of the reinforcement of a support plate 108, a feel in case the projection member 34 is damaged, or an acoustic sense.

[0068] Moreover, when the ink jet recording apparatus and the ink jet cartridge 16 are equipped with an electric discernment means to identify incorrect wearing of an ink jet cartridge, the purport by which carriage 107 was equipped with the ink jet cartridge 16 of the mistaken combination is indicated to the display panel (un-illustrating) of an ink jet recording apparatus. Therefore, although it is after wearing even when it equips with the ink jet cartridge 16 and a user has not recognized that it is incorrect wearing, it can know that it is incorrect wearing.

[0069] In addition, even if it is the ink jet cartridge 16 damaged by incorrect wearing, a breakage is only the projection member 34, and since the ink jet recording head 17 or the ink jet unit 18 of the ink jet cartridge 16 are not influenced at all even if the projection member 34 is damaged, the function which the ink jet cartridge 16 has, i.e., the ink regurgitation function of the ink jet recording head 17, the ink hold function of the ink tank 19, etc. are not spoiled. Therefore, if the ink jet recording device of right combination is equipped with the ink jet cartridge 16, it can be used that there is no trouble in any way.

[0070] As mentioned above, the projection member 34 as an incorrect wearing prevention means is formed in the ink jet cartridge 16, and since the projection member 34 is damaged before destroying an ink jet recording apparatus side even if it is the case where it equips with the ink jet cartridge 16 of the combination which was mistaken in

the ink jet recording apparatus by force, an ink jet recording apparatus is not damaged. [0071] Moreover, the projection member 34 can be used that there is no trouble in any way, if the ink jet recording device of right combination is equipped with the ink jet cartridge 16 even when it has been made to incorrect-equip with the ink jet cartridge 16 once since it is prepared in the part which does not affect the essential record function of the ink jet cartridge 16 even if the projection member 34 is damaged.

[0072] Next, the application of the ink jet cartridge of this operation gestalt is shown in drawing 12 and drawing 13. The perspective view showing the application of the ink jet cartridge which showed drawing 12 to drawing 6 from drawing 2, and drawing 13 are the perspective views showing the rear face of covering device material shown in drawing 12.

[0073] As shown in drawing 12 and drawing 13, in the ink jet cartridge 116 of this application, the projection member 134 is formed in the covering device material 130 as an outer wall member in the shape of a rectangular parallelepiped. The covering device material 130 is formed with Noryl resin, and, as for the magnitude of the projection member 134, this application is also formed in height of about 3mm, **** of 4mm, and die length of about 10mm. In addition, since each configuration of the ink jet cartridge 116 is the same as the ink jet cartridge 16 explained with reference to drawing 6 from drawing 2, detailed explanation is omitted.

[0074] Then, the process in which the carriage 207 of an ink jet recording apparatus is equipped with the ink jet cartridge 116 is explained. However, since it is the same as that of the case where the case where the ink jet cartridge 116 and an ink jet recording device are right combination is explained using drawing 8 and drawing 9, explanation is omitted.

[0075] Drawing 14 is the perspective view showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 12 was mistaken. In addition, since the configuration of each part of carriage 207 is the same as the carriage 7 shown in drawing 8, detailed explanation is omitted.

[0076] Thus, since the projection member 134 of the ink jet cartridge 116 contacts the top face of a support plate 208 as explained using drawing 11 in being the combination which the ink jet cartridge 116 and the ink jet recording apparatus mistook, carriage 207 cannot be equipped with the ink jet cartridge 116.

[0077] When the ink jet cartridge 116 is stuffed into a support plate 208 by force, in the ink jet cartridge 116 of this application, the projection member 134 of the covering device material 130 is not damaged, but by the thermal melting start stage as a fixed means from which it can be desorbed, caulking immobilization of the welding section 132,133 which is fixing the covering device material 130 to the ink jet cartridge 116 should separate, and the covering device material 130 should be desorbed from the ink jet cartridge 116. Since the disruptive strength of the welding section 132,133 of the covering device material 130 is set as reinforcement which is desorbed from the ink jet cartridge 116 before a support plate 208 is damaged, the components by the side of an ink jet recording device do not damage it. Thus, a user can be made to recognize clearly that it is incorrect wearing compared with the case where only the projection member which is a part of covering device material damaged and ****s, when the covering device material 130 ****s.

[0078] Drawing 15 is the plan showing the covering device material and welding pin of the ink jet cartridge shown in drawing 12 , and its A-A line sectional view. In the welding section 132,133 of the covering device material 130 in the ink jet cartridge 116, the welding pin 186 of a circular cross section as shown in drawing 15 is used. If the welding pin 186 of a circular cross section is crushed with heat, the perimeter of the welding pin 186 will weld to the pin hole 135 of the covering device material 130. However, when the perimeter of the welding pin 186 welds, the desorption reinforcement of the covering device material 130 becomes large, and when the ink jet recording apparatus of combination by which the ink jet cartridge 116 was mistaken is equipped, there is a possibility of damaging an ink jet recording apparatus, without the covering device material 130 ****ing. Then, a work which weakens intentionally reinforcement of the welding section of the covering device material 130 is carried out by making low welding temperature which melts the welding pin 186, or shortening welding time amount.

[0079] Moreover, when the ink jet recording apparatus is equipped with an electric discernment means to identify incorrect wearing of an ink jet cartridge, the purport by which carriage 207 was equipped with the ink jet cartridge 116 of the mistaken combination is indicated to the display panel (un-illustrating) of an ink jet recording apparatus. Therefore, although it is after wearing even when it equips with the ink jet cartridge 116 and a user has not recognized that it is incorrect wearing, it can know that it is incorrect wearing.

[0080] in addition, the function which the ink jet cartridge 116 has even if it is the ink jet cartridge 116 from which the covering device material 130 was desorbed by incorrect wearing, i.e., ink regurgitation machine ** of an ink jet recording head, -- the ink hold function of an ink tank etc. is not spoiled a little. Therefore, if the ink jet recording device of right combination is equipped with the ink jet cartridge 116, it can be used that there is no trouble in any way.

[0081] As mentioned above, since the covering device material 130 as an outer wall member which is the outer wall of the ink jet cartridge 116 ****s before it destroys an ink jet recording apparatus side even if it is the case where an ink jet recording apparatus is equipped with the ink jet cartridge 116 which is not right combination by force, an ink jet recording apparatus is not damaged. Furthermore, a user can be made to recognize clearly that it is incorrect wearing because the covering device material 130 which is some outer walls of the ink jet cartridge 116 ****s.

[0082] In addition, the fixed means of the covering device material 130 to the ink jet cartridge 116 is not restricted to the above-mentioned thermal melting start stage. For example, you may be an adhesion means to fix the welding pin 186 to the pin hole 135 of covering device material using the adhesives of optimum dose, and to fix the covering device material 130 to the ink jet cartridge 116. Moreover, you may be an attachment means to fix the covering device material 130 to the ink jet cartridge 116, by only a few's forming the outer diameter of the welding pin 186 thickly rather than the pin hole 135, and making the welding pin 186 and the pin hole 135 attach. Furthermore, the front faces of the ink jet cartridge 116 and the covering device material 130 may be fixed using a thermal melting start stage or an adhesion means, without forming the welding pin 186 and the pin hole 135.

[0083] Next, the further application of the ink jet cartridge shown in drawing 15 is shown in drawing 16 . Drawing 16 is the plan showing the covering device material and welding

pin in the further application of the ink jet cartridge shown in drawing 15 , and its A-A line sectional view.

[0084] As shown in drawing 16 , the configuration of the welding pin 286 may be formed so that a cross section may become an abbreviation cross-joint form. By making the cross-section configuration of the welding pin 286 into an abbreviation cross-joint form, since the welding area of the pin hole 235 of the covering device material 230 and the welding pin 286 becomes small, the welding reinforcement of the welding section 232,233 becomes small, and the desorption reinforcement of the covering device material 230 can be stopped low. Even if it does not make strict welding conditions, such as welding temperature at the time of melting the welding pin 286, and welding time amount, by this, caulking immobilization of the covering device material 230 can be carried out with the value near desired desorption reinforcement at the ink jet cartridge 216.

[0085] Thus, by making the cross-section configuration of the welding pin 286 into an abbreviation cross-joint form, since dispersion in the desorption reinforcement of the covering device material 230 is suppressed, the covering device material 230 can be more certainly desorbed at the time of incorrect wearing of the ink jet cartridge 216.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the perspective view showing the outline of 1 operation gestalt of an ink jet recording device in which the ink jet cartridge of this invention is used.

[Drawing 2] It is the perspective view showing the whole 1 operation gestalt configuration of the ink jet cartridge of this invention.

[Drawing 3] It is the fluoroscopy perspective view of the ink jet ink jet recording head in the ink jet cartridge shown in drawing 2 .

[Drawing 4] It is the decomposition perspective view of the ink jet cartridge shown in drawing 2 .

[Drawing 5] It is the perspective view showing the ink jet cartridge shown in drawing 2 in the condition of having seen from [which was shown in drawing 2 R> 2] A.

[Drawing 6] It is the perspective view showing the rear face of covering device material shown in drawing 5 .

[Drawing 7] It is the perspective view showing the ink jet unit anchoring section in the ink tank shown in drawing 4 .

[Drawing 8] It is the perspective view showing the whole ink jet cartridge configuration shown in the carriage and drawing 2 of the ink jet recording apparatus shown in drawing 1 .

[Drawing 9] It is the plan showing the condition of equipping the carriage of the ink jet recording apparatus of right combination with the ink jet cartridge shown in drawing 2 .

[Drawing 10] It is the perspective view showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 2 was mistaken.

[Drawing 11] It is the plan showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 2

was mistaken.

[Drawing 12] It is the perspective view showing the application of the ink jet cartridge shown in drawing 6 from drawing 2 .

[Drawing 13] It is the perspective view showing the rear face of covering device material shown in drawing 12 .

[Drawing 14] It is the perspective view showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 12 was mistaken.

[Drawing 15] They are the plan showing the covering device material and welding pin of the ink jet cartridge shown in drawing 12 , and its A-A line sectional view.

[Drawing 16] They are the plan showing the covering device material and welding pin in the further application of the ink jet cartridge shown in drawing 15 , and its A-A line sectional view.

[Description of Notations]

1 Ink Jet Recording Device

2 Leading Screw

2a Spiral slot

3 Guide Rail

4 Drive Motor

5 Six Driving force transfer gear

7,107,207 Carriage

7a Dark room

7b Flange slot

8,108,208 Support plate

8a Notch

9 Hook Susceptor

9a Hook

9b Hook side

9c Fixed shaft

10 Recorded Media

11 Platen Roller

12 Paper Bail Plate

13 14 Photo coupler

15 Lever

16,116,216 Ink jet cartridge

17 Ink Jet Recording Head

18 Ink Jet Unit

19 Ink Tank

19a Ink jet unit anchoring section

19b Base

20 Capping Means

21 Supporter Material

22 Suction Means

23 Opening in Cap

24 Frame Part Material

25 Support Plate Material

26 Cleaning Blade
27 Lever
28 Cam
29 Gear
30,130,230 Covering device material
31 Enclosure
32 33,132,133,232,233 Welding section
34,134 Projection member
35,135,235 Pin hole
36 Claw Part
37 Delivery
38 Electric Thermal-Conversion Object
39 Liquid Ink Way
40 Heater Board
41 Common Liquid Room
42 Top Plate
43 Ink Receiving Window
44 Delivery Plate
45 Base Material
46 Wiring Substrate
47a, 47b, 48, 49, 53, 54,134 Projection
50, 51, 52, 56, 63, 68, 69 Hole
55 Ink Supply Pipe
57 58 Crevice
59 60 Parallel slot
61 84 Pad
62 Pressure Spring
64 It is who Section Front.
65 Ink Feed Zone Material
66 Ink -- Conduit
67 Closure Pin
70 Cartridge Body
71 Ink Absorber
72 Tank Lid
73 Ink Feed Hopper
74 Atmospheric-Air Free Passage Opening
75 *****
76 Flange
77 Roof Section
78 Slit
79 Closure Member
80 Top-Face Section
81 Clearance
82 Inferior-Surface-of-Tongue Section
83 Sheet Metal Member
85 Flexible Sheet

86,186,286 Welding pin

87 Escape and it is Stop.

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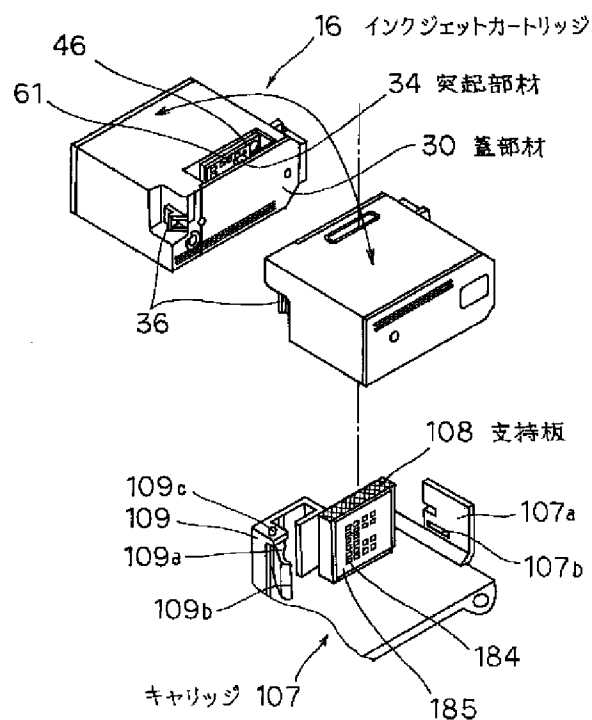
(74) 代理人 弁理士 若林 忠

(54) 【発明の名称】 インクジェットカートリッジ

(57) 【要約】

【課題】 インクジェット記録装置に正しい組合せではないインクジェットカートリッジを無理に装着した場合でも、インクジェット記録装置を破損しない。

【解決手段】 インクジェットカートリッジ16には、蓋部材30が固定されている。蓋部材30の裏面には、誤った組合せのインクジェット記録装置への誤装着を防止する誤装着防止手段としての突起部材34が設けられている。突起部材34の破壊強度は、インクジェットカートリッジ16をインクジェット記録装置に備えられたキャリアッジ107に装着させようとしたときに突起部材34と干渉する支持板108の破壊強度よりも、小さく設定されている。



【特許請求の範囲】

【請求項1】 インクを吐出して被記録媒体に記録を行うインクジェット記録ヘッド部と、前記インクジェット記録ヘッド部に供給されるインクを収容するインクタンクとが一体となって構成されてインクジェット記録装置に装着されるインクジェットカートリッジであって、装着しても使用できないインクジェット記録装置に装着しようとしたときに、前記インクジェット記録装置の一部と干渉することによって前記インクジェット記録装置への誤装着を防止する誤装着防止手段が設けられ、前記誤装着防止手段の破壊強度は、前記誤装着防止手段が干渉するインクジェット記録装置の部材の破壊強度よりも小さく設定されていることを特徴とするインクジェットカートリッジ。

【請求項2】 前記誤装着防止手段は突起部材である請求項1記載のインクジェットカートリッジ。

【請求項3】 前記誤装着防止手段は、前記インクタンクに脱離可能に固定された外壁部材を含み、前記外壁部材と前記インクタンクとの固定部の破壊強度が、前記誤装着防止手段が干渉する部材の破壊強度よりも小さく設定されている請求項1記載のインクジェットカートリッジ。

【請求項4】 前記外壁部材は、熱融着手段により前記インクタンクに固定されている請求項3記載のインクジェットカートリッジ。

【請求項5】 前記外壁部材は、接着手段により前記インクタンクに固定されている請求項3記載のインクジェットカートリッジ。

【請求項6】 前記外壁部材は、嵌着手段により前記インクタンクに固定されている請求項3記載のインクジェットカートリッジ。

【請求項7】 前記誤装着防止手段は、破壊されても前記インクジェットカートリッジが有する機能を損なわない位置に配設されている請求項1から6のいずれか1項記載のインクジェットカートリッジ。

【請求項8】 前記インクジェット記録ヘッドは、インクを吐出させるために利用される熱エネルギーを発生する電気熱変換体を有する請求項1から7のいずれか1項記載のインクジェットカートリッジ。

【請求項9】 インクは、前記電気熱変換体によって印加される熱エネルギーによって生じる膜沸騰を利用して吐出される請求項8記載のインクジェットカートリッジ。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、インクを吐出して被記録媒体に画像を記録するインクジェット記録装置に装着されるインクジェットカートリッジに関する。

【0002】

【従来の技術】コンピュータやワードプロセッサ、ワー

クステーション等の出力装置として用いられる記録装置、あるいは、複写機やファクシミリの出力手段として用いられる記録装置では、画像（文字や記号を含む。以下同じ。）が、記録装置に入力された画像情報に基づいて、記録用紙もしくはOHPシートなどのプラスチック薄板を始めとする被記録媒体に記録される。

【0003】このような記録装置の一つに、いわゆるインクジェット記録装置がある。インクジェット記録装置とは、インクジェット記録ヘッドに設けられたノズルから被記録媒体にインクを吐出して、被記録媒体に画像を記録する記録装置である。インクジェット記録装置の利点としては、高精度の画像を高速で記録できること、特別な処理がなされていない普通紙に記録できること、ノンインパクト式であるために記録時の騒音が小さいこと、さらに、多色のインクを使用してカラー画像を記録することが容易であること、インクジェット記録ヘッドの小型化が容易であること、などが知られている。

【0004】ところで、インクジェット記録装置におけるインクジェット記録ヘッドへのインク供給手段には、チューブ等を介してインクジェット記録ヘッドにインクタンクが接続された構成のものや、あるいは、インクジェット記録ヘッドとインクタンクとが一体化されたインクジェットカートリッジを用いたものなど、様々な形態のものがある。そのうち、インクジェットカートリッジに関しては、例えば米国特許第4771295号（特開昭63-84239号）に、記録装置に対して着脱可能に搭載され、交換可能なインクジェットカートリッジであって、インクタンク内にインク吸収体が充填され、インク吸収体にインクを含浸させているものが開示されている。なお、このようなインクジェットカートリッジは、既に広く市販されている。

【0005】一方、最近では、インクジェット記録ヘッドのノズルがより高密度に配列され、高精細な画像の記録が可能になっている。例えば、黒インクのみを用いた文字記録だけでなく、カラーインクを用いたカラー画像記録や、さらには、写真調の高画質な画像の記録も可能になっている。これに伴って、記録装置で用いられるインクの種類も多種多様になってきており、例えば、黒インクに関しては、染料を水系溶媒に溶かしたものだけでなく、顔料を用いたものや、染料であっても耐水性を有するものなどが使われている。また、カラーインクに関しては、単なるイエロー、マゼンダ、シアンのインクだけではなく、インクの各色の濃度を淡くすることにより、記録画像における単色部分と複数色が重ね合わされた部分との間の明度に階調性をもたせ、より高品位の記録画質を得ることができるイエロー、マゼンダ、シアンのインクや、さらには、レッド、グリーン、ブルーのインクも使われている。このような背景によってインクジェットカートリッジの種類が増加しており、また、各インクジェットカートリッジに対応すべく、インクジェ

ト記録装置の種類も増加している。

【0006】ところで、インクジェットカートリッジやインクジェット記録装置は、生産コストの低減や開発期間の短縮を図るために多数の部品が共通化されているので、各種類とも形状が類似している。そこで、インクジェット記録装置と、それに装着できてかつ良好に記録できるインクジェットカートリッジとの組合せについては、店頭での説明や、カタログ、取扱説明書によってユーザーサポートが行われている。しかしながら、ユーザーが、インクジェット記録装置に対応していないインクジェットカートリッジを誤って装着してしまう可能性は皆無ではない。インクジェット記録装置に対応していないインクジェットカートリッジが装着された場合は、インクジェット記録装置が備えているプリンタドライバでは駆動条件が異なるため、インク種類やインクの吐出量の違い、ノズル密度の違いなどにより、全く記録がされないか、もしくは正常な画像が記録されないケースが発生し得る。

【0007】そこで、このような事態を防止するため、インクジェット記録装置とインクジェットカートリッジとの少なくとも一方に、誤装着か否かを識別するための識別手段が備えられている。識別手段としては、インクジェットカートリッジに付された識別信号をインクジェット記録装置側に設けられている信号読取手段で読み取ることにより誤装着を識別する電気的な識別手段と、インクジェットカートリッジに凸部を設けるとともに、インクジェット記録装置にはインクジェットカートリッジの凸部が嵌合する凹部を設けるなどして、誤った組合せではインクジェットカートリッジをインクジェット記録装置に装着できなくすることにより誤装着を識別する構造的な識別手段とがある。

【0008】上記の識別手段のうち、電気的な識別手段では、インクジェットカートリッジが装着された後に誤装着であったか否かが識別される。ところが、インクジェット記録装置には、インクジェットカートリッジのノズルの吐出口面を保護したり、ノズルからインクを吸引するためのキャッピング手段が設けられており、このキャッピング手段には、インクジェット記録装置に前に装着されていたインクジェットカートリッジのインクが多少残っている。そのため、新たに装着されたインクジェットカートリッジのノズルにキャッピング手段が接触すると、ノズルおよびキャッピング手段の表面で、異質のインクが混合した状態になる。このように異質のインクが混合すると、インクの固着が促進されるなどの原因により、特にインクジェット記録ヘッドのノズルでは、記録を開始してから固着したインクが除去されるまでの間は、インクが正常に吐出されないため、記録した画像がかすれてしまうことがある。インクの固着がさらに進んだ場合には、インクジェット記録ヘッドのノズルが詰まったり、キャッピング手段が正常に機能しなくなること

も考えられる。

【0009】一方、上記の識別手段のうち、構造的な識別手段では、インクジェットカートリッジに設けられた凸部と、インクジェット記録装置に設けられた凹部とは、インクジェットカートリッジと記録装置とが正しい組合せの場合である場合にのみ、嵌合して、装着できるように設けられている。これにより、インクジェットカートリッジの誤装着を未然に防止することができるので、上記のように、異質のインクを混合させてしまうことがない。

【0010】そこで、インクジェットカートリッジの誤装着の識別手段には、上記の構造的な識別手段が広く用いられている。

【0011】

【発明が解決しようとする課題】しかしながら、上記の構造的な識別手段が用いられている場合では、インクジェット記録装置とインクジェットカートリッジとが誤った組合せであるにもかかわらず、ユーザーが気付かないまま無理にインクジェットカートリッジを装着してしまった場合には、インクジェット記録装置とインクジェットカートリッジのうち、少なくとも一方が破損してしまう。インクジェットカートリッジ側が破損した場合は、別の正規のインクジェットカートリッジを用意すれば直ちに記録することができる。しかし、インクジェット記録装置側が破損した場合には、インクジェット記録装置を修理する必要が生じ、修理期間中はインクジェット記録装置を使用できなくなることなどから、ユーザーが被る負担が大きく、インクジェット記録装置側の破損は好ましくない。

【0012】そこで本発明は、インクジェット記録装置に正しい組合せではないインクジェットカートリッジを無理に装着した場合であってもインクジェット記録装置を破損することがない、誤装着防止手段を有するインクジェットカートリッジを提供することを目的とする。

【0013】

【課題を解決するための手段】上記目的を達成するため、本発明のインクジェットカートリッジは、インクを吐出して被記録媒体に記録を行うインクジェット記録ヘッド部と、前記インクジェット記録ヘッド部に供給されるインクを収容するインクタンクとが一体となって構成されてインクジェット記録装置に装着されるインクジェットカートリッジであって、装着しても使用できないインクジェット記録装置に装着しようとしたときに、前記インクジェット記録装置の一部と干渉することによって前記インクジェット記録装置への誤装着を防止する誤装着防止手段が設けられ、前記誤装着防止手段の破壊強度は、前記誤装着防止手段が干渉するインクジェット記録装置の部材の破壊強度よりも小さく設定されている。

【0014】これにより、万一、装着しても使用できないインクジェット記録装置にインクジェットカートリッ

ジが無理に装着された場合には、インクジェット記録装置における部材のうち、誤装着防止手段が干渉する部分が破損する前に、インクジェットカートリッジの誤装着防止手段が破損する。

【0015】また、前記誤装着防止手段は突起部材であることにより、突起部材が破損するときの感触や聴覚によって、ユーザに誤装着であることが認識される。

【0016】さらに、前記誤装着防止手段は、前記インクタンクに脱離可能に固定された外壁部材を含み、前記外壁部材と前記インクタンクとの固定部の破壊強度が、前記誤装着防止手段が干渉する部材の破壊強度よりも小さく設定されていることにより、万一、装着しても使用できないインクジェット記録装置にインクジェットカートリッジが無理に装着された場合には、外壁部材がインクタンクから脱離する。従って、突起だけが破損して脱離する場合に比べて、ユーザに誤装着であることが明らかに認識される。

【0017】なお、前記外壁部材は、熱融着手段もしくは接着手段もしくは嵌着手段により前記インクタンクに固定されていることが好ましい。

【0018】また、前記誤装着防止手段は、破壊されても前記インクジェットカートリッジが有する機能を損なわない位置に配設されていることにより、誤装着により誤装着防止手段が破壊されたインクジェットカートリッジであっても、インクジェットカートリッジが有する機能は損なわれない。

【0019】

【発明の実施の形態】次に、本発明の実施形態について、図面を参照して説明する。

【0020】最初に、図1を用いて、本発明のインクジェットカートリッジが用いられるインクジェット記録装置の一実施形態の概略を説明する。図1は、本発明のインクジェットカートリッジが用いられるインクジェット記録装置の一実施形態の概略構成を示す斜視図である。

【0021】図1に示すように、インクジェット記録装置1には、螺旋溝2aが刻まれたリードスクリュー2が回転自在に支持されている。リードスクリュー2は、リードスクリュー2に設けられた駆動力伝達ギア6と、駆動力伝達ギア6に噛み合されて設けられている駆動力伝達ギア5とを介して、駆動モータ4の正逆回転に連動して回転される。また、インクジェットカートリッジ16が搭載されるキャリッジ7は、リードスクリュー2を支持する部分に設けられたピン（不図示）が螺旋溝2aに係合し、かつリードスクリュー2とガイドレール3とに対して摺動自在に設けられている。これにより、駆動モータ4の正逆回転に連動してピンが螺旋溝2aに誘導されるため、キャリッジ7は、プラテンローラ11の軸方向（図示のX軸方向）に沿って移動する。記録用紙やプラスチック薄板などの被記録媒体10は、プラテンローラ11によって紙送りされる。なお、被記録媒体10の

表面のうち、インクジェットカートリッジ16のインクジェット記録ヘッド（不図示）に対面する範囲では、プラテンローラ11よりも幅広に形成され、キャリッジ7の移動方向に沿って設けられている紙押え板12によって、被記録媒体10がプラテンローラ11の周面に押圧されている。

【0022】また、インクジェット記録装置1には、キャリッジ7に設けられたレバー15の通過を検出して駆動モータ4の回転方向の切替え等を行うためのホームポジション検出手段として、フォトカプラ13、14が備えられている。さらに、インクジェットカートリッジ16のインクジェット記録ヘッドが記録領域から外れた位置（例えば、ホームポジション）において、インクジェット記録ヘッドに対面する位置には、インクジェット記録ヘッドのインク吐出口面を覆う（キャッピング）ためのキャッピング手段20が配設されている。キャッピング手段20は、支持部材21によって支持され、さらにインクジェット記録ヘッドのインク吐出口からインクを吸引する吸引手段22が備えられ、キャップ内開口23を介してインクジェット記録ヘッドのインク吐出口を吸引することにより、インクジェット記録ヘッドの吸引回復が行われる。

【0023】インクジェット記録装置1の枠部材24には、支持板材25が取り付けられており、支持板材25に摺動可能に支持されたクリーニングブレード26は、駆動手段（不図示）により、図示のY軸方向に移動可能に設けられており、インクジェット記録ヘッドに接触および離間することによって、インクジェット記録ヘッドのクリーニングが行われる。

【0024】カム28は、キャリッジ7がある位置に移動したときに当接する位置に設けられている。レバー27は、キャリッジ7に動かされたカム28に連動して可動するように設けられている。レバー27の動きに伴って、ギア29やクラッチ（不図示）等の周知の動力伝達手段を制御することにより、駆動モータ4からの駆動力の伝達が制御される。

【0025】前述のキャッピング、吸引回復、クリーニングの各処理行程は、キャリッジ7がホームポジション領域に移動したときに、インクジェット記録ヘッドがキャップ内開口23もしくはクリーニングブレード26に対面する位置に位置合わせされて、行われる。これらの各処理行程とインクジェット記録ヘッドの位置合わせ行程は、周知のタイミングおよびシーケンスを利用して、任意の態様で行うことができる。また、これらの各処理行程は、単独で行ってもよいし、複合的に行ってもよい。

【0026】なお、インクジェット記録装置1には、インクジェットカートリッジ16に付された識別信号をインクジェット記録装置1側に設けられる信号読取手段で読み取ることにより誤装着を識別する電氣的な識別手段

が備えられていてもよい。

【0027】次に、本発明のインクジェットカートリッジの一実施形態の構成を説明する。図2は本発明のインクジェットカートリッジの一実施形態の全体構成を示す斜視図、図3は図2に示したインクジェットカートリッジにおけるインクジェット記録ヘッドの透視斜視図、図4は図2に示したインクジェットカートリッジの分解斜視図である。

【0028】図2および図4に示すように、インクジェットカートリッジ16は、インクジェット記録ヘッド17を備えたインクジェットユニット18と、インクを収容するインクタンク19とが一体に組み付けられた構造となっている。

【0029】図5は、図2に示したインクジェットカートリッジを図2に示したA方向から見た状態で示す斜視図、図6は、図5に示した蓋部材の裏面を示す斜視図である。

【0030】図5に示すように、蓋部材30は、インクジェットカートリッジ16の外壁の一部であるとともに、インクタンク19との間にインクジェットユニット18を包囲して収納する包囲空間31を形成している。また、インクジェットカートリッジ16には、後述するキャリッジ7のフック9a（図8参照）に係合される爪部36が設けられている。蓋部材30は、2箇所の融着部32、33でインクタンク19に固定されている。なお、図5および図6に示したように、蓋部材30の裏面には、誤った組合せのインクジェット記録装置への誤装着を防止する誤装着防止手段としての突起部材34が設けられている。また、図6に示すように、蓋部材30には、融着部32、33にピン孔35が設けられている。蓋部材30の2箇所のピン孔35には、それぞれ、インクタンク19に設けられている2箇所の融着ピン（不図示）が差し込まれ、融着ピンの頭部が熱によって押し潰されることにより、蓋部材30がインクタンク19に対してカシメ固定されている。本実施形態では、蓋部材30はノリ樹脂で形成されており、突起部材34の大きさは、高さ約3mm、幅約4mm、厚さ約0.5mm程度に形成されている。なお、蓋部材30の成形材料や突起部材34の形状および寸法は、上記に限定されるものではない。

【0031】続いて、インクジェット記録ヘッド17の構成について説明する。

【0032】図3に示すように、インクジェット記録ヘッド17には、複数の吐出口37が列状に設けられており、各吐出口37には、インクを供給するためのインク液路39が配設されている。各インク液路39には、吐出口37からインクを吐出させるためのエネルギー素子として、供給された印加電圧によって熱エネルギーを発生する電気熱変換体38が配設されている。画像信号に応じて各電気熱変換体38に駆動信号を選択的に印加す

ることによって、電気熱変換体38から発生する熱エネルギーによりインクに膜沸騰を生じさせて、インク液路39内に気泡を発生させる。この気泡をさらに成長させることによって、吐出口37からインク滴が吐出される。

【0033】なお、各電気熱変換体38はシリコン基板からなるヒーターボード40上に設けられ、各電気熱変換体38に電力を供給するアルミニウム等の配線や電極（不図示）とともに、エッチング、蒸着、スパッタリング等の半導体製造プロセスによる成膜技術によって一体的に形成される。これにより、吐出口37が高密度に配設されたインクジェット記録ヘッド17を容易に製造することができ、インクジェット記録ヘッド17の一層のコンパクト化を図ることができる。また、IC技術やマイクロ加工技術の長所を活用することにより、インクジェット記録ヘッド17の長尺化や面状化（2次元化）も容易であり、さらに、インクジェット記録ヘッド17のフルマルチ化および高密度実装化も容易である。

【0034】また、各インク液路39を区分するための隔壁や、各インク液路39へ供給されるインクを一時的に収納する共通液室41や、インクタンク19から共通液室41にインクを導入するためのインク受け口43（図4参照）等が設けられた天板42は、一体成形されている。天板42の成形材料としては、ポリスルホンが好ましいが、ポリエーテルスルホン、ポリフェニレンオキシド、ポリプロピレンなどの他の成形用樹脂材料を用いてもよい。

【0035】次に、インクジェットユニット18の構成について説明する。

【0036】図4に示すように、金属製の支持体45は、インクタンク19に設けられた2つの位置決め用の突起47a、47bおよび2つの熱融着保持用の突起48、49（突起49は図7参照）とに係合する孔50、51、52を有する他、キャリッジ7に対する位置決め用の突起53、54を有している。加えて、支持体45には、後述するインク供給管55を貫通させ、インクタンク19からのインク流路を形成するための孔56が形成されている。なお、支持体45の位置決め用の突起53、54の近傍には、それぞれ凹部57、58が設けられており、凹部57、58は、組み立てられたインクジェットカートリッジ16（図2参照）において、インクジェットカートリッジ16におけるインクジェットユニット18の周囲の3辺に形成されたそれぞれ複数の平行溝59、60の延長線上に位置することにより、ゴミやインク等の不要物が突起53、54に至ることがないように構成されている。

【0037】配線基板46は、支持体45に接着材等により貼着されている。配線基板46の一端には、インクジェット記録装置1からの電気信号を受けるための複数個のパッド61が設けられており、他端には、インクジ

ジェット記録ヘッド17の基板でもあるヒーターボード40の配線部分が接続されている。各パッド61は、インクジェット記録ヘッド17に設けられている各電気熱変換体38（図3参照）に対応しており、インクジェット記録装置1からの電気信号は、各パッド61を通り、各電気熱変換体38に個別に供給される。

【0038】インクジェット記録ヘッド17を支持体45に固定するための押えね62は、M字形状に形成されている。ヒーターボード40と天板42とは、押えね62と支持体45との間に配置されており、押えね62の足部を、支持体45の孔63を通して支持体45の裏面側に係合させることによって、ヒーターボード40と天板42とが、押えね62と支持体45との間に挟み込まれた状態で固定される。このとき、押えね62のM字形状の中央部により、天板42の外壁のうち、共通液室41（図3参照）の外壁の部分が軽圧で押圧されているとともに、押えね62の前だれ部64により、インクジェット記録ヘッド17のインク液路39（図3参照）の一部、好ましくは吐出口37近傍の領域が線圧で集中押圧されている。

【0039】インクタンク19から供給されるインクをインクジェット記録ヘッド17に供給するためのインク供給部材65には、インク供給管55が片持ち梁状に設けられており、かつインク供給管55に連結されたインク導管66が備えられ、さらに、インク導管66とインク供給管55との間の毛細管現象を確保するための封止ピン67が挿入されている。なお、インクタンク19とインク供給管55との結合部は、圧入により封止されている。

【0040】インク供給部材65は、モールド成形によって一体成形されるので、各部の寸法精度が高い。例えば、インク導管66のインク受け口43に対する圧接状態は、インク供給部材65の各部の寸法精度が高いので、安定している。ここで、インク導管66をインク受け口43に圧接させた状態で、インク供給部材65側から封止樹脂用接着剤を流し込めば、インク導管66とインク受け口43とのより確実な連通状態を得ることができる。また、支持体45に対するインク供給部材65の固定は、インク供給部材65に形成されている2本のピン（不図示）を支持体45の孔68、69に貫通させ、ピンを熱融着することにより、簡単に行われる。なお、ピンを熱融着したことによって支持体45のインクタンク19側に生じたわずかな突出部は、インクタンク19の表面のうち、インクジェットユニット18の取付け部の側面に形成された窪み（不図示）内に収められる。従って、インクタンク19にインクジェットユニット18を取付ける際の位置決めに支障をきたすことはない。

【0041】次に、インクタンク19の構成について説明する。

【0042】図4に示すように、インクタンク19は、

カートリッジ本体70と、インクを含浸して保持するインク吸収体71と、タンク蓋72とから構成され、インク吸収体71をインクジェットユニット取付け部19a側の反対側から挿入した後、タンク蓋72でインク吸収体71を封止することによって組み立てられる。インクタンク19のインクジェットユニット取付け部19aに設けられたインク供給口73は、インクジェットユニット18にインクを供給するためのものであり、インク供給口73の内部にはフィルタ（不図示）が設けられている。また、インクタンク19には、内部を大気に連通させるための大気連通口74が設けられており、さらに、大気連通口74には、大気連通口74からインクが漏洩するのを防止する撥液材75が挿入され、固定されている。

【0043】図7および図4を用いて、インクタンク19のインクジェットユニット取付け部19aの構成を説明する。図7は、図4中に示したインクタンク19におけるインクジェットユニット取付け部19aを示す斜視図である。

【0044】図7および図4に示すように、インクタンク19のインクジェットユニット取付け部19aにおいて、天板42の前面に一体に成形された吐出口プレート44の吐出口37のほぼ中心を通り、インクタンク19の底面19bの基準面に平行な直線を L_1 とすると、直線 L_1 上に、支持体45に形成されている2つの孔50に係合される2つの突起47a、47bが設けられている。突起47a、47bは、インクジェットユニット取付け部19aに対する支持体45の位置決めを行うものであり、突起47a、47bの高さは、支持体45厚さよりもわずかに低く形成されている。

【0045】また、インクジェットユニット取付け部19aには、突起48、49が設けられている。突起48、49は、支持体45に形成されている、インクジェットユニット取付け部19aへの固定用孔51、52に対応するものであり、突起47a、47bよりも長く形成されており、支持体45を貫通して突出した部分が熱融着されることによって、支持体45をインクジェットユニット取付け部19aに固定する。

【0046】直線 L_1 に垂直で、突起48を通る直線を L_3 、突起49を通る線を L_2 とすると、直線 L_3 上にはインク供給口73のほぼ中心が位置するので、インク供給口73とインク供給管55との連通状態が安定し、インクジェットカートリッジ16の落下などの衝撃によって連通状態が損なわれるおそれが軽減されている。また、直線 L_2 と直線 L_3 とは一致せず、突起47a周辺に突起48、49が存在しているので、インクジェットユニット取付け部19aに対するインクジェット記録ヘッド17の位置決め精度の向上が図られている。なお、曲線 L_4 は、インクジェットユニット取付け部19aにインクジェットユニット18が装着されたときの、インク

供給部材 6 5 の外壁位置である。インクジェットユニット 1 8 は、インク供給部材 6 5 が設けられている部分に重量が集中しているが、このように、インク供給部材 6 5 が、固定部である突起 4 8、4 9 にほぼ沿った位置に固定されるので、固定状態が安定しており、容易にインク供給部材 6 5 の固定位置がずれるようなことはない。

【0047】さらに、インクタンク 1 9 に設けられているつば 7 6 は、キャリッジ 7 に形成されているつば溝 7 b (図 8 参照) に挿入され、キャリッジ 7 に対するインクジェットカートリッジ 1 6 の姿勢が極端に悪くなることが防止される。また、インクタンク 1 9 のインクジェットユニット取付け部 1 9 a に設けられている抜け止め 8 7 が、キャリッジ 7 に設けられている引掛け部 (不図示) に係合されることにより、何らかの原因によってインクジェットカートリッジ 1 6 をキャリッジ 7 から離脱させる外力が作用しても、インクジェットカートリッジ 1 6 の装着状態が維持される。

【0048】図 5 に示すように、インクタンク 1 9 は、インクジェットユニット 1 8 が装着された後にインクジェットユニット取付け部 1 9 a が蓋部材 3 0 で覆われることにより、インクジェットユニット 1 8 を、下方開口 1 6 a を除いて包囲するように構成されている。しかし、インクジェットカートリッジ 1 6 がキャリッジ 7 に搭載されたときは、下方開口 1 6 a がキャリッジ 7 の表面に塞がれるため、実質的にはインクジェットユニット 1 8 を 4 方で包囲する包囲空間 3 1 が形成されることになる。従って、この包囲空間 3 1 内に設けられているインクジェットユニット 1 8 からの発熱は、この包囲空間 3 1 内に均一に分散して、この空間内を保温するものとして有効である。しかしながら、インクジェット記録装置 1 が長時間連続して使用された場合など、包囲空間 3 1 内にわずかな昇温を生ずることがある。このため、インクジェットユニット 1 8 からの自然放熱を助けるために、図 2 に示すように、インクタンク 1 9 の屋根部 7 7 に、この包囲空間 3 1 よりも小さい幅のスリット 7 8 を設けて、包囲空間 3 1 内の昇温を防止しつつ、外部環境に左右されずにインクジェットユニット 1 8 全体の温度分布の均一化が実現されている。

【0049】図 4 に示すように、インクジェットカートリッジ 1 6 の内部では、インクは、カートリッジ本体 7 0 の内部から、インク供給口 7 3、支持体 4 5 の孔 5 6 を通り、インク供給部材 6 5 の中裏面側に設けられた導入口を通してインク供給部材 6 5 内に供給され、インク供給部材 6 5 の内部を通った後、天板 4 2 のインク受け口 4 3 を通って共通液室 4 1 (図 3 参照) 内へと流入される。以上におけるインクの供給路の接続部には、例えば、シリコンやブチルゴム等からなるパッキンや O リングなどの封止部材 7 9 が配設され、これによって封止が行われて、インク供給路が確保される。

【0050】前述のように、インク供給部材 6 5、天板

4 2、カートリッジ本体 7 0 はそれぞれ一体成形部品であるので、廉価で寸法精度が高く形成されるばかりでなく、大量生産の品質向上に極めて有効である。又、部品点数が従来に比べて減少されているので、優れた消耗特性を確実に発揮することができる。

【0051】インクジェットカートリッジ 1 6 全体の説明に戻り、組み立てられたインクジェットカートリッジ 1 6 は、図 2 に示すように、インク供給部材 6 5 の上面部 8 0 と、インクタンク 1 9 のスリット 7 8 が形成された屋根部 7 7 の端部との間に、隙間 8 1 が形成されている。同様に、インク供給部材 6 5 の下面部 8 2 (図 4 参照) と、インクタンク 1 9 のインクジェットユニット取付け部 1 9 a の下部に設けられた薄板部材 8 3 (図 7 参照) との間にも、隙間 (不図示) が形成されている。これらの隙間は、スリット 7 8 での放熱効果を補助するとともに、インクジェットカートリッジ 1 6 に作用する不要な外力を吸収することにより、外力がインクジェットユニット 1 8 に直接作用することを防止している。

【0052】次に、本実施形態のインクジェット記録装置 1 におけるキャリッジ 7 の構成について説明する。図 8 は、図 1 に示したインクジェット記録装置のキャリッジおよび図 2 に示したインクジェットカートリッジの全体構成を示す斜視図である。

【0053】図 1 を用いて説明したように、キャリッジ 7 は、プラテンローラ 1 1 の軸方向に沿って移動するものである。図 8 に示すように、キャリッジ 7 には、プラテンローラ 1 1 (図 1 参照) に対向する部分に、前板 7 a が設けられている。前板 7 a には、インクジェットカートリッジ 1 6 の外壁に設けられたつば 7 6 (図 2 等参照) が差し込まれるつば溝 7 b が形成されている。

【0054】また、キャリッジ 7 には、電気接続用の支持板 8 が設けられている。支持板 8 の表面のうち、インクジェットカートリッジ 1 6 が装着されたときに配線基板 4 6 に対面する面には、配線基板 4 6 のパッド 6 1 に対応するパッド 8 4 を有するフレキシブルシート 8 5 が設けられている。なお、フレキシブルシート 8 5 の裏面には、各パッド 8 4 を裏側から押圧する凸部を有するゴムパッドシート (不図示) が備えられている。一方、支持板 8 の表面のうち、インクジェットカートリッジ 1 6 が装着されるときに、インクジェットカートリッジ 1 6 の蓋部材 3 0 に設けられた突起部材 3 4 が通る部分には、突起部材 3 4 との干渉を避けるための切欠き部 8 a が形成されている。

【0055】さらに、キャリッジ 7 には、インクジェットカートリッジ 1 6 を固定するためのフック 9 a が備えられている。フック 9 a は、フック 9 a を支持するためのフック支持台 9 に設けられた固定軸 9 c に対して回転自在に設けられており、フック 9 a の先端には、インクジェットカートリッジ 1 6 の爪部 3 6 に係合するフック面 9 b が形成されている。

【0056】次に、インクジェットカートリッジをインクジェット記録装置のキャリッジへ装着する過程を説明する。

【0057】まず最初に、インクジェットカートリッジとインクジェット記録装置とが正しい組合せである場合について、図8および図9を用いて説明する。ここで、インクジェットカートリッジとインクジェット記録装置とが正しい組合せである場合とは、上記で説明したインクジェット記録装置1とインクジェットカートリッジ16とが組合せられた場合をいう。

【0058】図9は、図2に示したインクジェットカートリッジを正しい組合せのインクジェット記録装置におけるキャリッジに装着する状態を示す上面図である。なお、図9では、インクジェットカートリッジ16とキャリッジ7の支持板8のみが示されており、インクタンクの屋根部77（図2参照）は省略して描かれている。

【0059】図8に示すように、インクジェットカートリッジ16の下方開口16aを有する面をキャリッジ7の表面に対面させ、下方開口16aをキャリッジ7の支持板8に挿入する。図8および図9に示すように、支持板8には切欠き部8aが設けられているので、インクジェットカートリッジ16に設けられている突起部材34が支持板8に干渉されることはなく、インクジェットカートリッジ16はキャリッジ7に正常に装着される。

【0060】インクジェットカートリッジ16がキャリッジ7に装着され、インクジェットカートリッジ16の底面がキャリッジ7の表面に接すると、インクジェットカートリッジ16のつば76が、キャリッジ7の前板7aに形成されているつば溝7bに差し込まれる。ついで、キャリッジ7に備えられているフック9aを回動させて、フック面9bをインクジェットカートリッジ16の爪部36に係合させると、インクジェットカートリッジ16がキャリッジ7に固定される。

【0061】このとき、支持板8のフレキシブルシート85にインクジェットカートリッジ16の配線基板46が圧接されているため、フレキシブルシート85のパッド84と配線基板46のパッド61とは接触した状態になる。これにより、インクジェット記録装置1からインクジェットカートリッジ16へ記録信号が伝送されるようになる。なお、フレキシブルシート85の裏面には、各パッド84を裏側から押圧する凸部を有するゴムパッドシート（不図示）が備えられているため、各パッド61、84間の接触圧力が増し、接触状態が安定している。

【0062】なお、インクジェット記録装置1およびインクジェットカートリッジ16に、インクジェットカートリッジの誤装着を識別する電気的な識別手段が備えられている場合には、インクジェット記録装置1の表示パネル（不図示）に、インクジェットカートリッジが正しく装着された旨の表示がされる。

【0063】次に、インクジェットカートリッジとインクジェット記録装置とが誤った組合せである場合について、図10および図11を用いて説明する。ここで、誤った組合せである場合とは、インクジェットカートリッジと、そのインクジェットカートリッジを装着しても使用できないインクジェット記録装置とが組み合わされた場合をいう。

【0064】図10は、図2に示したインクジェットカートリッジを誤った組合せのインクジェット記録装置のキャリッジに装着する状態を示す斜視図、図11は、図2に示したインクジェットカートリッジを誤った組合せのインクジェット記録装置のキャリッジに装着する状態を示す上面図である。なお、図11では、インクジェットカートリッジ16とキャリッジ107の支持板108のみが示されており、インクタンク109の屋根部77（図2参照）は省略して描かれている。

【0065】図10および図11に示すように、誤った組合せのインクジェット記録装置における支持板108には、インクジェットカートリッジ16の突起部材34との干渉を防ぐための切欠き部が設けられていない。なお、突起部材34の破壊強度は、支持板108の破壊強度よりも小さく設定されている。その他、キャリッジ107の各部は、図8に示したキャリッジ7と同じであるので、詳しい説明は省略する。

【0066】このように、インクジェットカートリッジ16とインクジェット記録装置とが誤った組合せである場合には、図11に示すように、インクジェットカートリッジ16の突起部材34が支持板108の上面に当接するため、インクジェットカートリッジ16をキャリッジ107に装着することができない。

【0067】万一、インクジェットカートリッジ16が無理にキャリッジ107に押し込まれた場合には、突起部材34の破壊強度は、支持板108の破壊強度よりも小さく設定されているので、支持板108が破損する前に蓋部材30の裏面に設けられている突起部材34が破損してインクジェットカートリッジ16がキャリッジ107に装着されるので、インクジェット記録装置側の部品が破損することはない。また、突起部材34が破損するときの感触や聴覚により、ユーザに誤装着であることを認識させることができる。本実施形態のインクジェットカートリッジ16の突起部材34は、約5kgfの荷重で破損するように設けられているが、支持板108の強度の改良や、突起部材34が破損するときの感触や聴覚の改良に応じて、突起部材34の破壊強度を変更してもよい。

【0068】また、インクジェット記録装置およびインクジェットカートリッジ16に、インクジェットカートリッジの誤装着を識別する電気的な識別手段が備えられている場合には、インクジェット記録装置の表示パネル（不図示）に、誤った組合せのインクジェットカートリ

ッジ16がキャリッジ107に装着された旨の表示がされる。従って、インクジェットカートリッジ16を装着したときにユーザが誤装着であることを認識できなかった場合でも、装着後ではあるが、誤装着であることを知ることができる。

【0069】なお、誤装着により破損したインクジェットカートリッジ16であっても、破損箇所は突起部材34だけであり、突起部材34が破損してもインクジェットカートリッジ16のインクジェット記録ヘッド17やインクジェットユニット18は何ら影響を受けないので、インクジェットカートリッジ16が有する機能、すなわち、インクジェット記録ヘッド17のインク吐出機能やインクタンク19のインク収容機能等は損なわれていない。そのため、インクジェットカートリッジ16を正しい組合せのインクジェット記録装置に装着すれば、何ら支障無く使用することができる。

【0070】以上のように、インクジェットカートリッジ16には誤装着防止手段としての突起部材34が設けられ、インクジェット記録装置に誤った組合せのインクジェットカートリッジ16を無理に装着した場合であっても、インクジェット記録装置側を破壊する前に突起部材34が破損するため、インクジェット記録装置を破損することがない。

【0071】また、突起部材34は、突起部材34が破損してもインクジェットカートリッジ16の本質的な記録機能に影響を与えない部分に設けられているため、インクジェットカートリッジ16を一度誤装着させてしまった場合でも、インクジェットカートリッジ16を正しい組合せのインクジェット記録装置に装着すれば、何ら支障無く使用することができる。

【0072】次に、本実施形態のインクジェットカートリッジの応用例を図12および図13に示す。図12は、図2から図6に示したインクジェットカートリッジの応用例を示す斜視図、図13は、図12に示した蓋部材の裏面を示す斜視図である。

【0073】図12および図13に示すように、本応用例のインクジェットカートリッジ116では、外壁部材としての蓋部材130に、突起部材134が直方体状に形成されている。本応用例でも、蓋部材130はノリ樹脂で形成されており、突起部材134の大きさは、高さ約3mm、幅約4mm、長さ約10mm程度に形成されている。その他、インクジェットカートリッジ116の各構成は図2から図6を参照して説明したインクジェットカートリッジ16と同じであるので、詳細な説明は省略する。

【0074】続いて、インクジェットカートリッジ116をインクジェット記録装置のキャリッジ207へ装着する過程を説明する。ただし、インクジェットカートリッジ116とインクジェット記録装置とが正しい組合せである場合については、図8および図9を用いて説明し

た場合と同様であるので、説明を省略する。

【0075】図14は、図12に示したインクジェットカートリッジを誤った組合せのインクジェット記録装置のキャリッジに装着する状態を示す斜視図である。なお、キャリッジ207の各部の構成は図8に示したキャリッジ7と同じであるので、詳しい説明は省略する。

【0076】このように、インクジェットカートリッジ116とインクジェット記録装置とが誤った組合せである場合には、図11を用いて説明したように、インクジェットカートリッジ116の突起部材134が支持板208の上面に当接するため、インクジェットカートリッジ116をキャリッジ207に装着することができない。

【0077】万一、インクジェットカートリッジ116が無理に支持板208に押し込まれた場合には、本応用例のインクジェットカートリッジ116では、蓋部材130の突起部材134が破損するのではなく、脱離可能な固定手段としての熱融着手段によって蓋部材130をインクジェットカートリッジ116に固定している融着部132、133のカシメ固定が外れて、インクジェットカートリッジ116から蓋部材130が脱離する。蓋部材130の融着部132、133の破壊強度は、支持板208が破損する前にインクジェットカートリッジ116から脱離するような強度に設定されているので、インクジェット記録装置側の部品が破損することはない。このように蓋部材130が脱離することにより、蓋部材の一部である突起部材だけが破損して脱離する場合に比べて、ユーザに誤装着であることを明らかに認識させることができる。

【0078】図15は、図12に示したインクジェットカートリッジの蓋部材と融着ピンとを示す上面図、およびそのA-A線断面図である。インクジェットカートリッジ116での蓋部材130の融着部132、133では、図15に示すような、円形断面の融着ピン186が用いられている。円形断面の融着ピン186を熱によって押し潰すと、融着ピン186の全周が蓋部材130のピン孔135に融着する。ところが、融着ピン186の全周が融着してしまうと、蓋部材130の脱離強度が大きくなってしまい、インクジェットカートリッジ116を誤った組合せのインクジェット記録装置に装着したときに、蓋部材130が脱離せずに、インクジェット記録装置を損傷してしまうおそれがある。そこで、融着ピン186を溶かす融着温度を低くしたり、融着時間を短くしたりすることで、蓋部材130の融着部の強度を意図的に弱くするような工夫がされている。

【0079】また、インクジェット記録装置に、インクジェットカートリッジの誤装着を識別する電気的な識別手段が備えられている場合には、インクジェット記録装置の表示パネル（不図示）に、誤った組合せのインクジェットカートリッジ116がキャリッジ207に装着さ

れた旨の表示がされる。従って、インクジェットカートリッジ116を装着したときにユーザが誤装着であることを認識できなかった場合でも、装着後ではあるが、誤装着であることを知ることができる。

【0080】なお、誤装着により蓋部材130が脱離したインクジェットカートリッジ116であっても、インクジェットカートリッジ116が有する機能、すなわち、インクジェット記録ヘッドのインク吐出機能やインクタンクのインク収容機能等は損なわれていない。そのため、インクジェットカートリッジ116を正しい組合せのインクジェット記録装置に装着すれば、何ら支障無く使用することができる。

【0081】以上のように、インクジェット記録装置に正しい組合せではないインクジェットカートリッジ116を無理に装着した場合であっても、インクジェットカートリッジ116の外壁である外壁部材としての蓋部材130が、インクジェット記録装置側を破壊する前に脱離するので、インクジェット記録装置を破損することがない。さらに、インクジェットカートリッジ116の外壁の一部である蓋部材130が脱離することで、ユーザに、誤装着であることを明らかに認識させることができる。

【0082】なお、インクジェットカートリッジ116への蓋部材130の固定手段は上記の熱融着手段に限られない。例えば、適量の接着剤を用いて融着ピン186を蓋部材のピン孔135に固定して、インクジェットカートリッジ116に蓋部材130を固定する接着手段であってもよい。また、融着ピン186の外径をピン孔135よりも少しだけ太く形成し、融着ピン186とピン孔135とを嵌着させることにより、インクジェットカートリッジ116へ蓋部材130を固定する嵌着手段であってもよい。さらには、融着ピン186とピン孔135とを設けずに、インクジェットカートリッジ116と蓋部材130との表面同士を、熱融着手段や接着手段を用いて固定してもよい。

【0083】次に、図15に示したインクジェットカートリッジのさらなる応用例を図16に示す。図16は、図15に示したインクジェットカートリッジのさらなる応用例における蓋部材と融着ピンとを示す上面図、およびそのA-A線断面図である。

【0084】図16に示すように、融着ピン286の形状は、断面が略十字形になるように形成されていてもよい。融着ピン286の断面形状を略十字形とすることで、蓋部材230のピン孔235と融着ピン286との融着面積が小さくなるため、融着部232、233の融着強度が小さくなり、蓋部材230の脱離強度を低く抑えることができる。これにより、融着ピン286を溶かす際の融着温度や融着時間などの融着条件を厳密なものとしなくても、所望の脱離強度に近い値で、蓋部材230をインクジェットカートリッジ216にカシメ固定す

ることができる。

【0085】このように、融着ピン286の断面形状を略十字形とすることで、蓋部材230の脱離強度のばらつきが抑えられるので、インクジェットカートリッジ216の誤装着時に、蓋部材230をより確実に脱離させることができる。

【0086】

【発明の効果】以上説明したように、本発明のインクジェットカートリッジは、装着しても使用できないインクジェット記録装置に装着しようとしたときに、インクジェット記録装置の一部と干渉することによってインクジェット記録装置への誤装着を防止する誤装着防止手段が設けられ、誤装着防止手段の破壊強度は、誤装着防止手段が干渉する部材の破壊強度よりも小さく設定されているので、インクジェット記録装置に正しい組合せではないインクジェットカートリッジを無理に装着した場合であっても、インクジェット記録装置を破損することがない。

【0087】また、誤装着防止手段は突起部材であることにより、突起部材が破損するときの感触や聴覚によって、ユーザに誤装着であることを認識させることができる。

【0088】さらに、誤装着防止手段は、インクタンクに脱離可能に固定された外壁部材を含み、外壁部材とインクタンクとの固定部の破壊強度が、誤装着防止手段が干渉する部材の破壊強度よりも小さく設定されていることにより、突起部材だけが破損して脱離する場合に比べて、ユーザに誤装着であることを明らかに認識させることができる。

【0089】また、誤装着防止手段は、破壊されても前記インクジェットカートリッジが有する機能を損なわない位置に配設されていることにより、誤装着により誤装着防止手段が破壊されてもインクジェットカートリッジが有する機能は損なわれず、インクジェットカートリッジを正しい組合せのインクジェット記録装置に装着すれば、何ら支障無く使用することができる。

【図面の簡単な説明】

【図1】本発明のインクジェットカートリッジが用いられるインクジェット記録装置の一実施形態の概略を示す斜視図である。

【図2】本発明のインクジェットカートリッジの一実施形態の全体構成を示す斜視図である。

【図3】図2に示したインクジェットカートリッジにおけるインクジェット記録ヘッドの透視斜視図である。

【図4】図2に示したインクジェットカートリッジの分解斜視図である。

【図5】図2に示したインクジェットカートリッジを図2に示したA方向から見た状態で示す斜視図である。

【図6】図5に示した蓋部材の裏面を示す斜視図であ

る。

【図7】図4中に示したインクタンクにおけるインクジェットユニット取付け部を示す斜視図である。

【図8】図1に示したインクジェット記録装置のキャリッジおよび図2に示したインクジェットカートリッジの全体構成を示す斜視図である。

【図9】図2に示したインクジェットカートリッジを正しい組合せのインクジェット記録装置のキャリッジに装着する状態を示す上面図である。

【図10】図2に示したインクジェットカートリッジを誤った組合せのインクジェット記録装置のキャリッジに装着する状態を示す斜視図である。

【図11】図2に示したインクジェットカートリッジを誤った組合せのインクジェット記録装置のキャリッジに装着する状態を示す上面図である。

【図12】図2から図6に示したインクジェットカートリッジの応用例を示す斜視図である。

【図13】図12に示した蓋部材の裏面を示す斜視図である。

【図14】図12に示したインクジェットカートリッジを誤った組合せのインクジェット記録装置のキャリッジに装着する状態を示す斜視図である。

【図15】図12に示したインクジェットカートリッジの蓋部材と融着ピンとを示す上面図、およびそのA-A線断面図である。

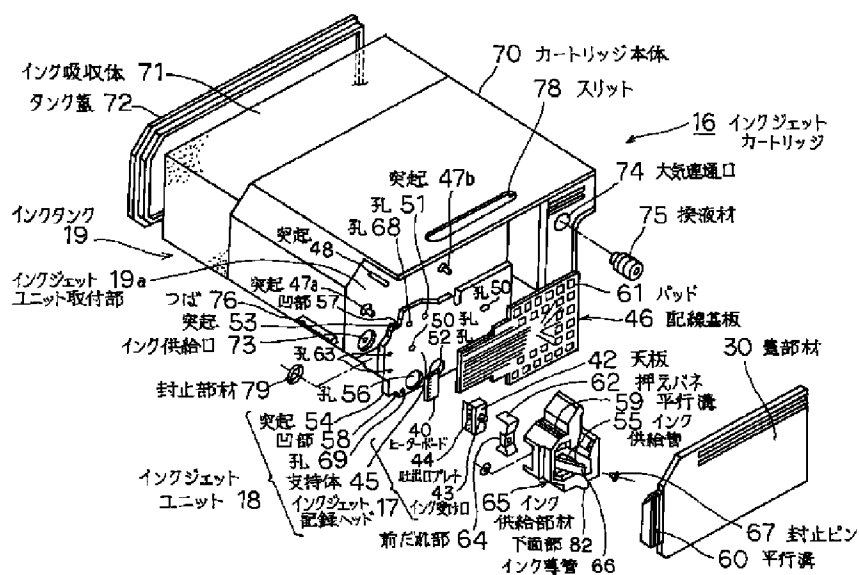
【図16】図15に示したインクジェットカートリッジのさらなる応用例における蓋部材と融着ピンとを示す上面図、およびそのA-A線断面図である。

【符号の説明】

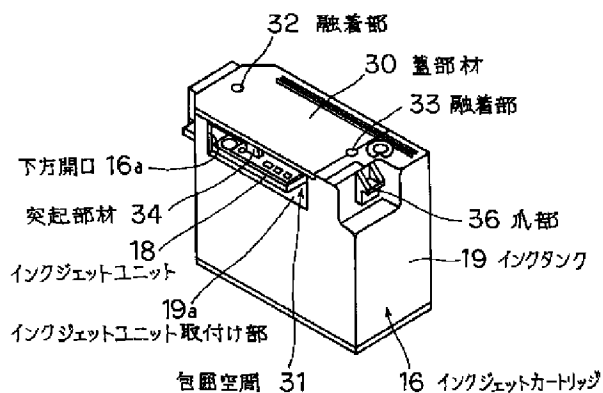
1 インクジェット記録装置
2 リードスクリュー
2 a 螺旋溝
3 ガイドレール
4 駆動モータ
5, 6 駆動力伝達ギア
7, 10 7, 20 7 キャリッジ
7 a 前板
7 b つば溝
8, 10 8, 20 8 支持板
8 a 切欠き部
9 フック支持台
9 a フック
9 b フック面
9 c 固定軸
10 被記録媒体
11 プラテンローラ
12 紙押え板
13, 14 フォトカブラ
15 レバー
16, 11 6, 21 6 インクジェットカートリッジ

17 インクジェット記録ヘッド
18 インクジェットユニット
19 インクタンク
19 a インクジェットユニット取付け部
19 b 底面
20 キャッピング手段
21 支持部材
22 吸引手段
23 キャップ内開口
24 枠部材
25 支持板材
26 クリーニングブレード
27 レバー
28 カム
29 ギア
30, 13 0, 23 0 蓋部材
31 包囲空間
32, 33, 13 2, 13 3, 23 2, 23 3 融着部
34, 13 4 突起部材
35, 13 5, 23 5 ピン孔
36 爪部
37 吐出口
38 電気熱変換体
39 インク液路
40 ヒーターボード
41 共通液室
42 天板
43 インク受け口
44 吐出口プレート
45 支持体
46 配線基板
47 a, 47 b, 48, 49, 53, 54, 13 4 突起
50, 51, 52, 56, 63, 68, 69 孔
55 インク供給管
57, 58 凹部
59, 60 平行溝
61, 84 パッド
62 押えばね
64 前だれ部
65 インク供給部材
66 インク導管
67 封止ピン
70 カートリッジ本体
71 インク吸収体
72 タンク蓋
73 インク供給口
74 大気連通口
75 換液材

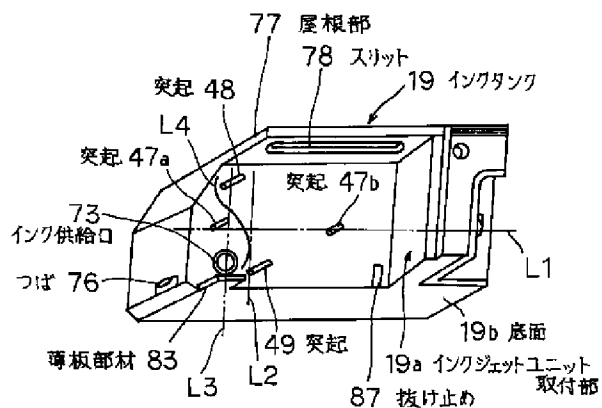
【図4】



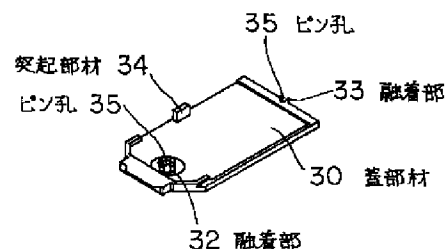
【図5】



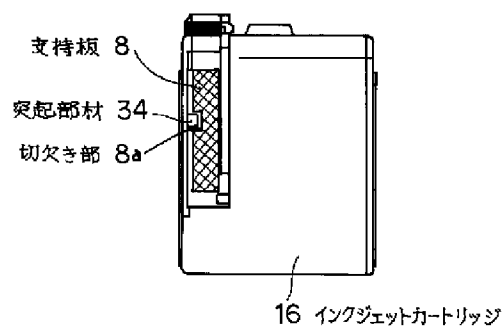
【図7】



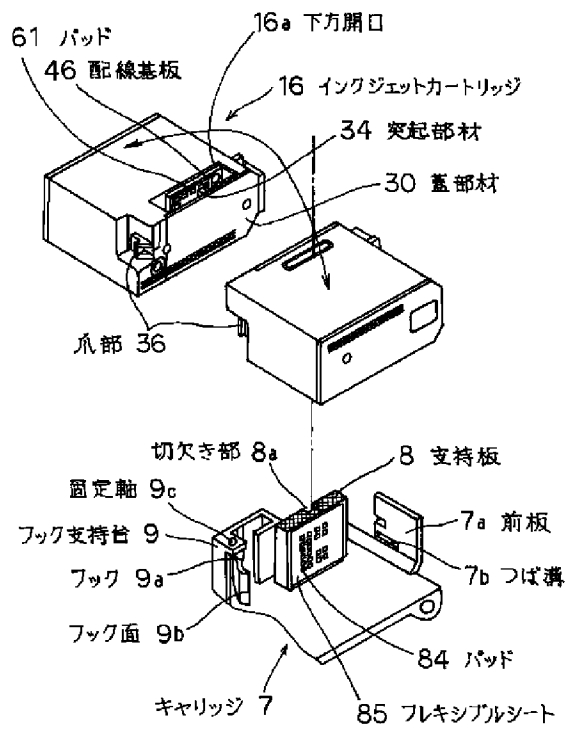
【図6】



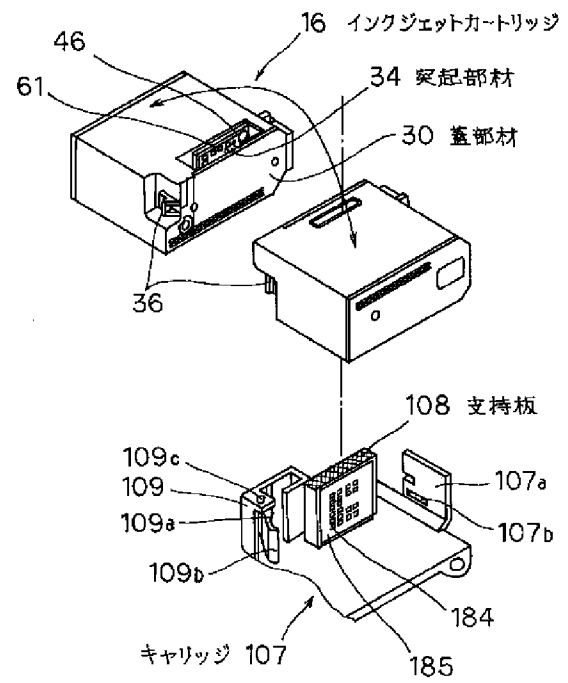
【図9】



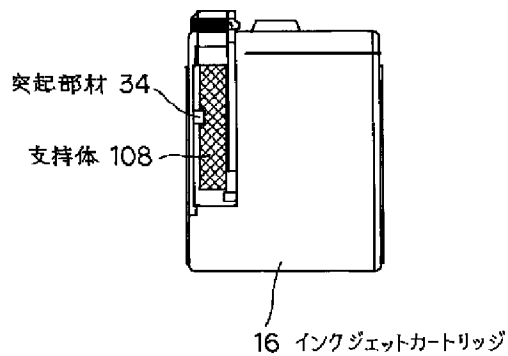
【図 8】



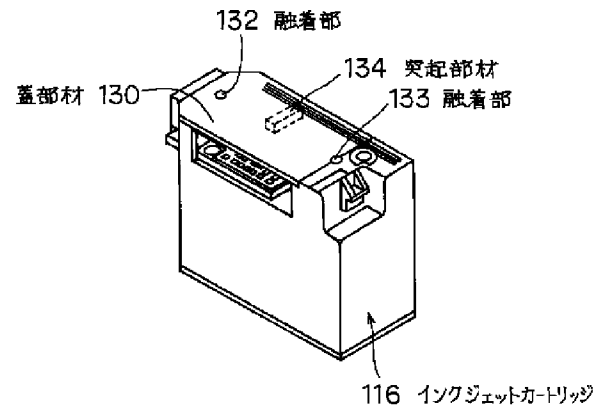
【図 10】



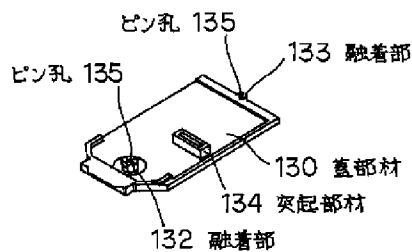
【図 11】



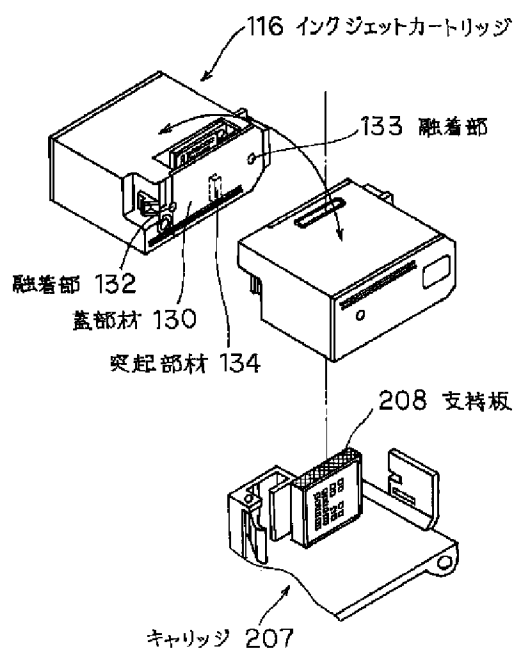
【図 12】



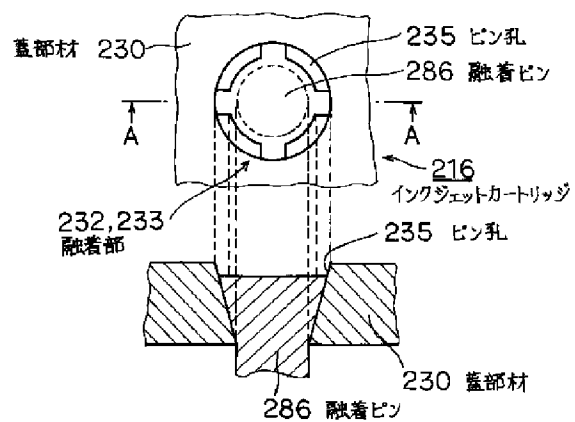
【図 13】



【図14】



【図16】



【図15】

